CURTIS'S
BOTANICAL MAGAZINE,

COMPRISING THE

Plants of the Royal Gardens of Kew,

AND

OF OTHER BOTANICAL ESTABLISHMENTS IN GREAT BRITAIN;
WITH SUITABLE DESCRIPTIONS;

BY

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F.R.S., F.L.S., ETC.,
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VOL. XLVI.
OF THE THIRD SERIES.
(Or Vol. CXVI. of the Whole Work.)

"When the warm sun that brings
Seed-time and harvest has returned again,
'Tis sweet to visit the still wood, where springs
The first flower of the plain."

LONGFELLOW.

LONDON:
L. REEVE & CO., 5, HENRIETTA STREET, COVENT GARDEN.
1890.

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SHOUT
SHARE
IT

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TO

GEORGE FERGUSSON WILSON, ESQ., F.R.S., F.L.S., &c., &c.

Heather Bank, Weybridge.

My dear Mr. Wilson,

You will, I hope, gratify me by accepting the dedication to you, of this, the 116th Volume of the Botanical Magazine, and thus enabling me to add one more name, and that a most worthy one, to the long list of zealous, skilful, and disinterested devotees of horticulture, whose services have been commemorated in successive annual issues of this work.

Believe me,

Very sincerely yours,

JOS. D. HOOKER.

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M. S. del. J. N. Fitch lith.

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Tab. 7093.

HELIAMPHORA NUTANS.

Native of British Guiana.

Nat. Ord. Sarraceniaceæ.

Genus Heliamphora, *Benth.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 48.)

H. nutans, *Benth. in Trans. Linn. Soc.* vol. xviii. p. 432, t. 29 (*Ic. in Flore des Serres, iterat.* t. 2246–7; *F. im Thurn in Trans. Linn. Soc. Ser.* 2, vol. ii. p. 263, 271.

The remarkable plant here figured, discovered exactly half a century ago, had up to within the last few years been seen in a living state by only two naturalists, the brothers Schomburgk. These energetic travellers, when on a journey to determine the boundary line between British Guiana, Brazil, and Venezuela in 1839, were the first to make known that extraordinary castellated mountain Roraima, which, rising perpendicularly from an elevated table-land, itself 6000 feet above the sea, was supposed to be, as regards its summit, inaccessible. On the marshy Savanna at the base of the mountain they found a Pitcher plant, and recognizing its interest, Sir Robert made an excellent drawing of it, which, with dried specimens, he communicated to his friend Mr. Bentham for description and publication. The result is an admirable paper on *Heliamphora nutans* by the latter botanist, which appeared in the year following its discovery, in the Transactions of the Linnæan Society. In his account of *Heliamphora*, Bentham, recognizing its close affinity in the character of the fruit and foliage with the Sarracenias of North America, placed it in the same Order, pointing out at the same time great differences. Thus whilst *Sarracenia* has a double pentamerous perianth, single-flowered scapes, three-bracteolate flowers, a stigma almost unique for size and construction, and large dilated lids that arch over the mouths of the pitchers, *Heliamphora* has a single four- to six-merous (sepaline) perïanth, three- to five-flowered scapes, unibracteate flowers, a stigma of minute

size and quite simple structure, and a rudimentary lid of the pitchers represented from a very early stage by little more than a constriction at the apex of those organs.

Of these differences two only have been bridged over by the comparatively recent discovery of a third genus of *Sarraceniaceæ*, namely *Darlingtonia* (Tab. 5920), in which the stigma is intermediate in complexity of structure, and the lid of the pitcher, whilst never closing that organ, undergoes another and a very different development from either of its co-ordinates. Turning to the fruits of the three genera, they are essentially the same except in the structure of the testa of the seeds, which in *Sarracenia* are obscurely winged along the raphe, in *Heliamphora* broadly winged all round, and in *Darlingtonia* wingless but clothed with squarrose bristles. The essential structure and functions of the pitcher are the same in all three genera, the interior of the latter presenting detentive hairs on the upper part, and a glandular secreting surface below.

Viewing the relations between these three genera to one another, the question naturally arises whether to regard *Heliamphora* as a degraded, or an ancestral, member of the Order. I incline to the latter view, though it points to the surmise that the Order originated in a region now separated by upwards of 2000 miles from that inhabited by any of its other members, in so far as their distribution is known. Possibly, not probably, other *Sarraceniaceæ* may exist in the little known mountain regions of Venezuela, though such may not be expected to occur in the volcanic areas of Central America and the West Indies.

It remains to add that *Heliamphora* was first refound by Burke, an English Orchid Collector in the Roraima district in 1881, who brought plants of it to Messrs. Veitch and Sons; and that in 1884 Mr. im Thurn collected it on the occasion of his reaching the supposed inaccessible summit of Roraima. In his account of the botanical collections which he made during that expedition (Trans. Linn. Soc. Ser. 2, ii. 263), he mentions *Heliamphora* as growing "in wide spreading very dense tufts in the very wettest places, where the grass happens not to be long. The red-veined pitchers, its delicate white flowers raised high on red-tinted stems, its sturdy habit of growth, make it a pretty little picture

wherever it grows. But it attains its full size and best development, not down in the swamp, but up on the ledges of the cliff of Roraima, and even on the top (about 8000 feet)."

In the above notice, Mr. im Thurn speaks of the red-veined pitchers, a character that has not appeared in the cultivated plant, but which is most marked in Sir R. Schomburgk's drawing, where on every pitcher are about seven strong broad red longitudinal nerves with defined margins. Also in the same figure the number of perianth segments varies from five to six, and they are very unequal in size and irregular as to insertion.

The accompanying figure is from a beautiful plant which was flowered by Messrs. Veitch in June, 1889. The very large leaf outlined at the back, and the analyses of the fruit are from Herbarium specimens; the former is of a specimen sent by Mr. im Thurn from the top of Roraima.—*J. D. H.*

Fig. 1, Apex of pedicel and stamens; 2, stamen; 3, pistil; 4, transverse section of the ovary; 5, ripe capsule; 6, seed; 7, nucleus of the same cut vertically; 8, embryo:—*all enlarged.*

M. Smith del, J.N. Fitch lith.

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Tab. 7094.

PLEUROTHALLIS ornata.

Native of Mexico.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Pleurothallis, *Br.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 488.)

Pleurothallis *ornata;* cæspitosa, acaulis, foliis parvis breviter petiolatis ellïpticis subacutis v. apice 3-denticulatis crasse coriaceis, pedunculis foliis longioribus gracilibus, racemis elongatis erectis laxifloris flexuosis, bracteis tubulosis appressis, floribus parvis pedicellatis, sepalis e basi erecta patenti-recurvis subæqualibus ellipticis obtusis fusco-flavidis creberrime rubro-maculatis appendiculis elongatis hyalinis pendulis marginatis, petalis falcatis subspathulatis obtusis, labelli ungue gracili, limbo oblongo obtuso basi cordato disco basin versus callo compresso instructo, columna superne in alam galeatam denticulatam dilatato.

P. ornata, *Reichb. f in Witten. Gartenzeit.* 1882, p. 106; *F. Oliver in Nature,* vol. xxxvi. (1887) p. 303.

The genus *Pleurothallis* is one of the largest amongst Orchids. In the Genera Plantarum it is credited with about 350 described species, and a considerable number of undescribed. In respect of number it ranks below two only, *Epidendrum* and *Habenaria*, each of which boasts of 400; but when its wider range of country, minute size, and inconspicuous flower are taken into account, it may well be that it will eventually prove to dominate over all other genera of the Order. In the Catalogue of all known names of described plants up to the year 1885, which is being prepared at Kew for the new Nomenclator, and which botanists will owe to the liberality of Darwin, upwards of six hundred entries under the genus *Pleurothallis* will be found. As might be expected, the arrangement of so vast a concourse of species, many of them ill or imperfectly defined, into subordinate groups, is a matter of great difficulty. Lindley in the "Folia Orchidacea" proposed ten sections, founded almost entirely on habit, of which so many appeared to Bentham to be unnatural combinations, that on a revision of the species he has (in Gen. Plant. iii. 488) rearranged them under seven sections.

P. ornata in Lindley's classification belongs to the

"*Apodæ cæspitosæ*,' distinguished by their tufted habit, absence of a rootstock, small leaves, much exceeded by the scape, and long raceme of many small flowers. Happily in this instance Bentham's and Lindley's sections so far coincide, that the latter has retained for the section the name *Apodæ*.

Fortunately *P. ornata* has a character for which it may be distinguished from all its known congeners in the exquisitely beautiful silvery threads, all of equal length, that fringe the sepals, and being attached by an almost imperceptible base wave with every motion of the flower or air. These threads have been studied by Mr. Frank Oliver, and described in "Nature" (see citation above). Each is slightly clavate in form, gradually enlarging from the base to the obtuse apex; its walls are thin and transparent, and its cavity contains air alone. A careful examination of the base of each shows that it is formed by the elongation of one of a group of very small marginal epidermal cells, the swollen base of which is embraced by the cells on either side of it, as shown in fig. 5, which is copied from Mr. Oliver's drawing. These threads have been compared to the curious pendulous and equally vibratile organs of *Bulbophyllum lemniscatum* (Plate 5961), in which they proceed one from the back of each sepal; but whereas the threads of *P. ornata* are of the simplest structure, those of the *Bulbophyllum* are extraordinarily complex, as a reference to the plate shows. Another plant with analogous appendages is *Epicrianthes javanica*, Blume (*Bulbophyllum*, nob.), in which six pendulous threads in clusters of three replace each petal; the structure of these is known to me only from a drawing by Parish, which represents them as entirely similar to those of *Pleurothallis ornata*; Blume, however, describes them as fleshy.

Pleurothallis ornata flowered in the Royal Gardens in April, 1887. The plant was presented by Messrs. Shuttleworth and Carder, of Clapham.—*J. D. H.*

Fig. 1, Section of leaf; 2 and 3, flowers; 4, portion of sepal with appendages; 5, transverse section through margin of sepal, showing insertion of appendage; 6, flower with sepals removed; 7, lip; 8, column; 9, pollinia:—*all enlarged.*

M. S. del. et J. N. Fitch Lith.

Vincent Brooks Day & Son Imp.

Tab. 7095.

PROTEA nana.

Native of South Africa.

Nat. Ord. Proteaceæ.—Tribe Proteeæ.

Genus Protea, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 169.)

Protea (Acrocephalæ) *nana*; frutex glabra, bipedalis, ramosa, foliis confertis erecto-patentibus acicularibus acutis acuminatisve, capitulis terminalibus nutantibus hemisphæricis, squamis 3–4-seriatis appressis oblongis obtusis, exterioribus virescentibus sericeo-marginatis, intimis coccineis glaberrimis flores ciliatos longe superantibus, perianthii hirsutuli labio majore in laminam spathulatam producto, minore filiformi apice cymbiformi 3-denticulato, antheris sessilibus obtuse apiculatis, ovario hirsuto, **stylo exserto glabro curvo, stigmate fusiformi.**

Protea nana, *Thunb. Diss. Prot.* p. 30; *Prodr. Fl. Cap.* p. 130; *Linn. Syst. Veg. Ed.* 14, p. 139; *Ait. Hort. Kew, Ed.* 2, vol. i. p. 192; *Brown in Trans. Linn. Soc.* vol. x. p. 87; *Meissn. in DC. Prodr.* vol. xiv. pars 1, p. 241.

P. rosacea, *Linn. Mant.* p. 189; *Lamk. Ill.* vol. i. p. 238; *Encycl. Bot.* vol. v. p. 653; *Smith Exot. Bot.* vol. i. p. 85, t. 44.

P. acuifolia, *Salisb. Parad.* p. 2.

Leucadendron nanum, *Berg. in Act. Stockholm*, 1766, p. 325; *Plant. Cap.* p. 22 (*excl. syn. Petiv.*).

L. pinifolium, *DC. mss.*

On the authority of Aiton's Hortus Kewensis, *Protea nana* was introduced into England in 1787 by Francis Masson, a collector sent to South Africa from Kew; and it seems surprising that so attractive and striking a plant should have been lost to cultivation. In this respect it has shared the fate of a vast number of equally handsome or even handsomer species of *Protea* and its allies, not to mention other South African plants that ornamented the greenhouses of our grandfathers. Of *Protea* itself, a genus containing upwards of sixty known species, about one-half have, previous to the first quarter of this century, been both cultivated and figured in Europe, chiefly in England, and thirteen of these in this Magazine. The dates of publication of the latter give a fair idea of the epochs during which their cultivation was encouraged: thus, of the first thousand plates there were of

Protea four, all published between 1796 and 1806; of the second thousand, four again are of *Protea* (between 1809 and 1815); of the third thousand, four (between 1823 and 1827); since which, from 1827 to 1881, or out of 3838 plates, only one is of a *Protea*, and that published as late as 1881, to be followed in 1889 by the species here figured. And what applies to *Protea* applies to Cape plants in general, for I feel sure that a sifting of the figures of the species of *Erica*, *Stapelia*, and other South African genera published in this work, would give a like result. The history of the Australian *Proteaceæ*, under a horticultural point of view, offers a similar example of a neglected branch during late years; but the flourishing epochs of these and *Proteaceæ* differ, chiefly because the earliest Kew collectors were South African, the later Australian. Under Plate 6558 (*Protea penicillata*), I have given the reasons why Cape *Proteaceæ* have fallen out of cultivation, and I must refer to the remarks under that species for further information on the subject.

Protea nana is a native of rocky places in the Cape Town district. The plant figured was raised from seed sent to the Royal Gardens by Professor MacOwan, Director of the Cape Town Botanical Gardens. It flowered in a cool green-house.—*J. D. H.*

Fig. 1, Tip of leaf; 2, flower; 3, posticous lip of perianth with one anther; 4, anticous lip with three anthers; 5, vertical section of ovary, showing the ovule:—*all enlarged.*

Tab. 7096.

ROSA berberifolia.

Native of Persia and Western Turkestan.

Nat. Ord. Rosaceæ.—Tribe Roseæ.

Genus Rosa, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 625.)

Rosa *berberifolia*; foliis subsessilibus simplicibus cuneato-obovatis oblongisve glaucis apices versus serratis dentatisve, stipulis 0, floribus solitariis, ovario globoso sepalisque lanceolatis simplicibus hispido-setosis, petalis orbiculatis aureis ima basi macula purpurea v. sanguinea notatis, ovariis glaberrimis, stylis liberis inclusis pilis flexuosis hirsutis, stigmate dilatato reniformi, fructu globoso, carpellis oblique ovoideis glaberrimis.

Rosa berberifolia, *Pallas in Nov. Act. Petrop.* vol. x. p. 379, t. 10, f. 5; *Redouté et Thor. Ros.* vol. i. p. 87, *cum Ic.*; *DC. Prodr.* vol. ii. p. 602; *Ledeb. Fl. Alt.* vol. ii. p. 224; *Ic. Plant. Ross.* t. 370; *Ait. Hort. Kew, Ed.* 2, vol. iii. p. 258; *Lindl. Ros. Monogr.* p. 1; *Wallroth Monogr. Ros.* p. 25; *Kar. & Kiril. Enum. Plant. Fl. Alt.* No. 322; *Aitchison in Trans. Linn. Soc. Ser.* 2, vol. iii. p. 62; *Masters in Bull. Soc. Bot. Belg.* vol. xxviii. *ined.*; *in Gard. Chron.* 1889, vol. ii. p. 9, fig. 1, 2; and p. 78, fig. 13.

R. simplicifolia, *Salisb. Hort. Allert.* 359; *Parad.* t. 101; *Olivier Voy.* vol. v p. 49, t. 43.

Hulthemia berberifolia, *Dumort. Dissert. Tournay*, 1824, p. 8 (*ex Endlich. Gen.*); *Ledeb. Fl. Ross.* vol. ii. p. 72; *Boiss. Fl. Orient.* vol. ii. p. 668.

Lowea berberifolia, *Lindl. in Bot. Reg.* t. 1261.

Rhodopsis, *Bunge in Ledeb. Fl. Alt.* vol. ii. p. 224.

Few plants were more asked after during my Directorship of the Royal Gardens than the simple-leaved Rose, a plant that had often been in cultivation but lost, and which in so far as I knew did not then exist in cultivation. Discovered by Pallas about the middle of the last century, it was introduced into England about 1790 through the exertions of Sir Joseph Banks, and was figured by Salisbury in his Hortus Paradisaicus (t. 101). Nothing further appears to have been heard of it as a cultivated plant till the publication of the beautiful figure in the Botanical Register, from a plant that flowered in 1828 in the Royal Horticultural Society's Gardens, and which was raised from seed sent by Sir Henry Willock from Persia. Dr. Lindley, writing eloquently and pathe-

tically, says of the plant "that it resists cultivation in a remarkable manner, submitting permanently neither to budding, nor grafting, nor laying, nor striking from cuttings, nor, in short, to any of those operations, one or other of which succeed with other plants. Drought does not suit it; it does not thrive in wet; heat has no beneficial effect, cold no prejudicial influence; care does not improve it, neglect does not injure it. Of all the numerous seedlings that were raised from Sir H. Willock's seeds and distributed, scarcely a plant remains alive. Two are still growing in a peat border in the Chiswick Garden; but they are languishing and unhealthy; and we confess that observation of them in a living state, for nearly four years, has not suggested a single method of improving the cultivation of the species."

On the other hand, I have the pleasure of citing, in his own words, the success of Mr. Watson, Assistant Curator of Kew, in both cultivating and propagating this interesting plant:—

"At Kew this rose is planted in a raised border of rich porous loam in a cool green-house where Cape bulbs are grown. It is exposed to full sunshine all the year round. During summer the soil is kept moist, but after October, when the leaves fall off, it is kept as dry as possible, and the plant remains dormant until March."

"We have failed to propagate this rose by means of grafts or cuttings, although tried in the various ways which answer with other roses. Several plants have, however, been obtained from the suckers developed by the old plant. These suckers grow under the soil for about a foot before pushing through and forming leaves. If the underground part is cut through after the sucker is about six months old, roots are formed on the severed part."

Returning to the history of the species, I find from a note in the late J. Gay's Herbarium now at Kew, that Professor Bertoloni, writing in 1831, when Director of the Bologna Botanical Gardens, mentions the *Rosa berberifolia* as being in cultivation there, and as having been for sixteen years previous to that date, but that its origin was unknown. For the latest notice I must refer to Brigade-Surgeon Aitchison's "Account of the Botany of the Affghan Boundary Commission," to which that energetic botanist

M.S.del. J.N.Fitch.lith.

was Naturalist, published in the Transactions of the Linnean Society cited above. Ap. p. 62, it is described as the most characteristic shrub of the country (N. Persia) from Bala Morghab westwards over the whole Badghis the Hari rud valley into Khorasan, up to an altitude of 5000 feet. That is, from about Long. 63° to 60° E., where, as that gentleman informs me, it forms low dense patches. From that region it stretches north-westwards into Western Turkestan, finding its northern and eastern limits in the Soongarian Altai, about 90° E. and 45° N. The specimen here figured was from plants raised by seed which Dr. Aitchison sent in to Kew in 1885, which flowered in May, 1889, and which are of a more straggling habit than the native specimens.

For an excellent summary of the points in which *Rosa berberifolia* differs from its congeners so greatly as to have suggested its generic separation, I must refer to Dr. Masters' "Remarks on the Morphology of *Rosa berberifolia*" in the Bulletin of the Botanical Society of Belgium. After stating that according to some botanists the plant has no leaves,—to others that it has no stipules,—to others that the stipules constitute the leaves,—and to still others that the spines constitute the stipules, his own careful analysis shows that the stipules are suppressed, but potentially present, and may possibly be developed in vigorous cultivated specimens.—*J. D. H.*

Fig. 1, Petal; 2 and 3, stamens; 4, carpel; 5, fruit; 6, achene:—*all but fig. 5 enlarged.*

M. S. del. J. N. Fitch lith.

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Tab. 7097.

IRIS (XIPHION) Boissieri.

Native of Portugal.

Nat. Ord. Irideæ.—Tribe Moræeæ.

Genus Iris, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 686.)

Iris (Xiphion) *Boissieri;* bulbo parvo oblongo, caule gracili simplici subpedali, foliis radicalibus subteretibus subpedalibus viridibus facie profunde canaliculatis, superioribus paucis sensim minoribus, supremis bracteiformibus, spathæ valvis ventricosis rigidulis, pedicello brevissimo, ovario cylindrico acute trigono, limbo violaceo segmentis exterioribus obovato-cuneatis carinâ lutea pilis paucis instructa, segmentis interioribus erectis obovato-unguiculatis, styli cristis parvis deltoideis.

I. (Xiphion) Boissieri, *Henriquez in Bolet. Brot.* vol. iii. p. 183, with figure; *Willk. Illust. Plant. Hisp.* vol. ii. p. 46, t. 118; *Foster in Gard. Chron.* 1887, vol. ii. p. 38.

This new bulbous Iris is known only on a single mountain in the south of Portugal, the Serra do Gerez, where it grows at an altitude of from two thousand to three thousand feet above sea-level. It belongs to the true Xiphions, the same group that includes the well-known English and Spanish Irises of gardens, with all their multiform variations in the size and colouring of the flower, and is nearest to *I. filifolia*, Boiss. (*Xiphion filifolium*, Hook. fil. in Bot. Mag. t. 5928), which is also a native of the Spanish Peninsula. It differs, however, from all its neighbours in having a rudimentary beard, like that of a *Pogoniris*, down the keel of the lower part of the outer segments. There is a specimen in the Kew herbarium, collected by Winkler in 1876. It was first flowered in England in 1877 by Professor M. Foster, who received the bulbs from Mr. A. W. Tait of Oporto. Our drawing is made from material supplied by Messrs. Barr and Son, of Tooting and Covent Garden. It flowers in England at the beginning of June.

Descr. *Bulb* small, oblong, with thin brown outer tunics and a few fleshy root-fibres. *Stem* a foot long, slender, terete, simple, bearing at the base one or two

subterete long-pointed green leaves a foot long, deeply channelled down the face, and higher up several others, which grow gradually smaller till the uppermost is entirely bract-like and adpressed. *Spathe* inflated, two inches long; valves greenish and moderately firm at the flowering time; pedicel very short. *Flower* scentless; ovary cylindrical, acutely trigonous, an inch long; perianth-tube green, slender, above an inch long; limb bright lilac, an inch and a half long; outer segments with an obovate reflexing blade, about as long as the cuneate claw, with a bright yellow keel down the face, which is furnished with a few gland-tipped hairs like those of the beard of a *Pogoniris;* inner segments as long as the outer, erect, obovate-unguiculate, half an inch broad. *Style-branches* reddish-lilac, under an inch long; crests small, erect, deltoid. *Anthers* yellow, half an inch long.—*J. G. Baker.*

Fig. 1, Front view of anther; 2, back view of anther; 3, top of style-branch, with crests and stigmas:—*all enlarged.*

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Tab. 7098.

PODOPHYLLUM pleianthum.

Native of Formosa.

Nat. Ord. Berberidaceæ.—Tribe Berbereæ.

Genus Podophyllum, *Linn.*; (*Benth. et Hook.f. Gen. Pl.* vol. i. p. 45.)

Podophyllum *pleianthum*; glaberrimum, foliis peltatis convexis orbicularibus 9-lobis lobis late ovatis acutis ciliato-denticulatis, floribus inter folia 2 opposita numerosis umbellatim confertis pendulis, sepalis linearioblongis obtusis viridibus, petalis duplo longioribus obovato-oblongis luride purpureis apices versus crispatis, staminibus 6, ovario ellipsoideo, stylo brevi, stigmate cupulari dentato.

P. pleianthum, *Hance in Journ. Bot.* vol. xxi. (1883) pp. 175 and 362. *The Garden*, 1889, ii. 299, f. 44..

Podophyllum pleianthum is a near ally of the North American Mandrake, May-apple or Duck's-foot, *P. peltatum*, a plant common in the Eastern United States, and introduced into cultivation in England as long ago as 1616. For two centuries *P. peltatum* was the only known species of the genus, until 1821 in fact, when the late Dr. Wallich discovered another in Nepal, the *P. Emodi*. Both these species have solitary flowers, white in the North American plant, pink in the Himalayan; but whereas in the former the flower is axillary, springing from the meeting of the two leaves, and the stamens are double the number of the petals; in the latter they are extra-axillary, being inserted on the petiole of the upper of the two leaves, and the stamens are the same in number as the petals. The discovery, therefore, of a species with axillary flowers and stamens and petals isomerous, as is the case with *P. pleianthum*, was an interesting fact, rendered all the more so from its departing from both its congeners in being many-flowered and the corolla of a deep purple colour.

P. pleianthum was discovered in the Island of Formosa, in 1881, by T. Watters, Esq., H.B.M. Consul in that island, who sent specimens to the late eminent Chinese botanist, Dr. Hance, who published it, and whose excellent descrip-

tion in the Journal of Botany contains an exhaustive comparison of the characters of the three then known species as enumerated above.

Not long after the discovery of *P. pleianthum*, Dr. Hance had the good fortune to receive specimens of a fourth species, from the continent of China, *P. versipelle*, Hance (in Journ. Bot. vol. xxi. 362), which has clustered extra-axillary flowers and six stamens. Its leaves are much like those of *P. pleianthum*, but more deeply divided.

The flowers of *P. pleianthum* and *versipelle* have a most offensive smell, like those of many *Aroideæ*, which I do not find to have been observed in other species. The leaves and roots of the American Mandrake are drastic and poisonous, but the sweet and subacid fruit is eatable, as I found that of the Himalayan species to be.

Plants of *P. p'eianthum* were sent to the Royal Gardens by Mr. Charles Ford, F.L.S., Superintendent of the Hong Kong Botanic Gardens, in 1885, and it flowered in August of last year. It came along with the singular *Eomecon chionanthe* (Plate 6871), and was cultivated in a pot in a cold frame till 1889, when it was planted and flowered in a border of loam in a cold house.—*J. D. H.*

. Fig. 1, Stamen and pistil; 2, transverse, and 3, vertical section of ovary:—*all enlarged.*

M & N. J. Bates, Lith.

Vincent Brooks Day & Son, Imp.

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Tab. 7099.

COTTONIA macrostachya.

Native of the Peninsula of India and Ceylon.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Cottonia, *Wight*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 572.)

Cottonia *macrostachya*; caule suberecto 6–8-pollicari folioso internodiis brevibus, foliis loratis recurvis canaliculatis inæqualiter 2-lobis, scapo 12–18-pollicari erecto gracili distanter ramoso, ramis apices versus floriferis, bracteis parvis ovatis, pedicellis elongatis cum ovario ½–1 pollicaribus, sepalis oblongis obtusis petalisque angustioribus patentissimis luride flavis sanguineo-striatis, labello sepalis multo majore et latiore purpureo aureo marginato, lobis lateralibus parvis auriculæformibus, terminali amplo patente subpanduræformi retuso, marginibus late villosis.

Cottonia macrostachya, *Wight Ic. Pl. Ind. Or.* t. 1755; *Dalz. & Gibs. Bomb. Fl.* 263; *Lindl. in Journ. Linn. Soc.* vol. iii. p. 39.

C. peduncularis, *Reichb. f. in Cat. Orchid. Schill.* 1857, p. 52; *Thwaites Enum. Pl. Zeylan.* 303; *Walp. Ann.* vol. vi. p. 860.

Vanda peduncularis, *Lindl. Gen. & Sp. Orchid.* 216; *Paxt. Fl. Gard.* vol. iii. t. 253.

An interesting Orchid, as being the only Indian one known to me of which the lip resembles that of an *Ophrys*. This was observed by Lindley when describing the plant, partly from a drawing made in Ceylon; and it may be added that *Ophrys aranifera* is the species to which it makes the nearest approach in form and colour; but whereas in the Spider Orchid the insect's eyes are counterfeited by the two coloured calli at the base of the lip, in *Cottonia* the same effect is produced by the minute basal lobes of the lip itself.

Cottonia was first described as *Vanda peduncularis* by Lindley, from which genus it differs in the absence of a spur on the lip. Later, Wight perceiving that it was no *Vanda*, and hence not suspecting that it was the Ceylon plant described under that genus by Lindley, gave it the name *Cottonia* after Major (now Major-General and C.S.I.) Cotton, of the Madras Engineers, an indefatigable collector and successful cultivator of Orchids, who found it at Tellicherry in Malabar, and sent to Dr. Wight specimens

and a drawing. Since that period it has been found in other localities in the Western Ghats, extending as far north as the Warree country. The genus is, as far as at present known, monotypic; for the *Cottonia Championii* of Lindley, a plant with a wide distribution, being found in Eastern Bengal, Ceylon, Tenasserim and Hong Kong, differs so greatly in habit, foliage, inflorescence, lip and column, that it is strange that it should ever have been supposed to be congeneric. I have named this latter plant *Diploprora* (Flor. Brit. Ind. vol. v. ined.) from the compressed two-beaked cymbiform lip; unlike *C. macrostachya*, it is a plant of no horticultural attractions, and it has not as yet been in cultivation in England.

Cottonia macrostachya was introduced into England about forty years ago, and there is a figure of it in Paxton's Flower Garden; but it had long been out of cultivation till reintroduced of late years.

The specimen here figured, which flowered in the Royal Gardens in May of last year, was received from the Director of the Ceylon Botanical Gardens in 1885. Mr. Watson informs me that it requires the same treatment as the tropical Vandas, and flowers annually, the flowering season extending over three months.—*J. D. H.*

Fig. 1, Lip; 2, column; 3, anther; 4 and 5, pollinia:—*all enlarged.*

M.C. del., E Bates imp.

L. Reeve & Co., London.

Vincent Brooks Day &

Tab. 7100.

DROSERA cistiflora.

Native of South Africa.

Nat. Ord. Droseraceæ.

Genus Drosera, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 662)

Drosera *cistiflora*; caule erecto simplici gracili folioso 1–6-floro, foliis linearibus creberrime glandulosis, floribus amplis roseis violaceis v. albis, sepalis lineari-lanceolatis glanduloso-puberulis, petalis late cuneato-obovatis margine exteriore crenulatis, filamentis brevissimis, antheris oblongis, ovarii stylis a basi 2-partitis ramis inter filamenta porrectis capillaribus petalis dimidio brevioribus, apicibus flabellatim multifidis stigmatosis.

D. cistiflora, *Linn. Amœn. Acad.* vol. vi. p. 85; *Burm. Pl. Afric.* p. 210, t. 75. f. 2; *Thunb. Diss. Dros.*; *Fl. Cap.* p. 279; *DC. Prodr.* vol. i. p. 319; *Planch. in Ann. Sc. Nat. Ser.* 3, vol. ix. (1848) p. 202; *Harv. & Sond. Fl. Cap.* vol. i. p. 78.

D. speciosa, *Presl, Bot. Bemerk.* 14; *Planch. l. c.* 202; *Walp. Ann.* vol ii. p. 72.

D. Helianthemum, *Planch. l. c.* p. 203; *Walp. l. c.*

D. violacea, *Willd. Enum. Plant. Hort. Reg. Berol.* 340.

The most beautiful of all known Sundews, at least in so far as the species in cultivation are concerned; and this form of it especially, for the scarlet flowers are not invariable. Thunberg describes two varieties, one he calls *alba*, with white petals spotted at the base; the other, *violacea*, with rosy red or purple flowers. There are besides a *D. speciosa* of Presl, retained as a species by Planchon, with fewer and less glandular leaves, and which is the *D. cistiflora* var. β. of E. Meyer, and *D. Helianthemum* of Planchon, with a taller many-leaved three- to six-flowered stem, and which is the *D. cistiflora* var. *multiflora* of Eckl. and Zeyher. Amongst the numerous specimens in the Kew Herbarium, there are many that are intermediate between the other species retained by Planchon.

The genus has been divided by De Candolle into two sections, namely *Rorella*, with rosulate leaves, leafless scapes, and sparingly divided or simple styles, and *Ergaleium* with usually leafy stems and much-branched

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styles, to the latter of which *D. cistiflora* belongs, though placed by De Candolle in the former. Planchon, on the other hand, has divided *Drosera* into thirteen sections, upon characters, however, which Bentham does not find sufficiently constant to be regarded as good, or so natural as to be useful. Of these thirteen *D. cistiflora* belongs to sect. *Ptycnostigma*, with forked styles bearing flabellately multifid tips, and an ovary with three placentas.

D. cistiflora is confined to the south-west corner of South Africa, and in so far as is at present known does not extend beyond 150 miles from Cape Town in any direction. Within that limit it has been found by every collector, and is no doubt a common plant. The specimens here figured were presented by Miss North in 1889, and flowered in a sunny green-house. Mr. Watson informs me that the flowers last about a fortnight, after which the leafing stem dies, but the roots remain healthy, as with other Cape species and with the Australian *D. dichotoma*.

Descr. *Root* of fascicled fibres from a slender rhizome. *Stem* six to twelve inches high, erect, slender, leafy, pubescent with minutely glandular hairs. *Leaves* two to four inches long, by one-sixth of an inch broad, spreading, linear, subacute, copiously clothed on the margin and upper surface with the glandular hairs of the order; stipules 0. *Flowers* one to three at the end of the stem, erect, nearly two inches in diameter. *Sepals* lanceolate, acute, not half the length of the petals, green, pubescent. *Petals* cuneately obovate, rose-red scarlet violet or white; outer margin erose, rounded truncate or retuse. *Stamens* very short; anthers oblong, red-brown, longer than the filaments. *Ovary* subglobose, deeply laterally three-lobed; styles cleft to the base, segments capillary, projecting horizontally between the bases of the filaments for upwards of half the length of the petals, white, tips flabellately lacerate with stigmatic arms.—*J. D. H.*

Fig. 1, Apex of leaf; 2 and 3, stamens; 4, ovary:—*all enlarged.*

M.S. del. J.N.Fitch, lith.

Vincent Brooks Day & Son Imp.

Tab. 7101.

CHIRONIA palustris.

Native of South Africa.

Nat. Ord. Gentianeæ.—Tribe Chironieæ.

Genus Chironia, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 805.)

Chironia *palustris*; perennis, caule robusto erecto tereti folioso, foliis radicalibus confertis lineari-spathulatis obtusis in petiolum latum angustatis, caulinis sessilibus basi connatis, calycis segmentis lineari-lanceolatis tubum corollæ amplæ roseæ æquantibus, corollæ lobis ellipticis obtusis tubum superantibus, antheris lineari-oblongis tortis, stylo lente curvo.

C. palustris, *Burchell's Travels*, vol. ii. p. 226.

C. Krebsii, *Griseb. Gen. & Sp. Gent.* p. 98.

Plocandra palustris, *Griseb. in DC. Prodr.* vol. ix. p. 43.

P. albens, *E. Mey. Comm. Pl. Afr. Aust.* fasc. 2, p. 181.

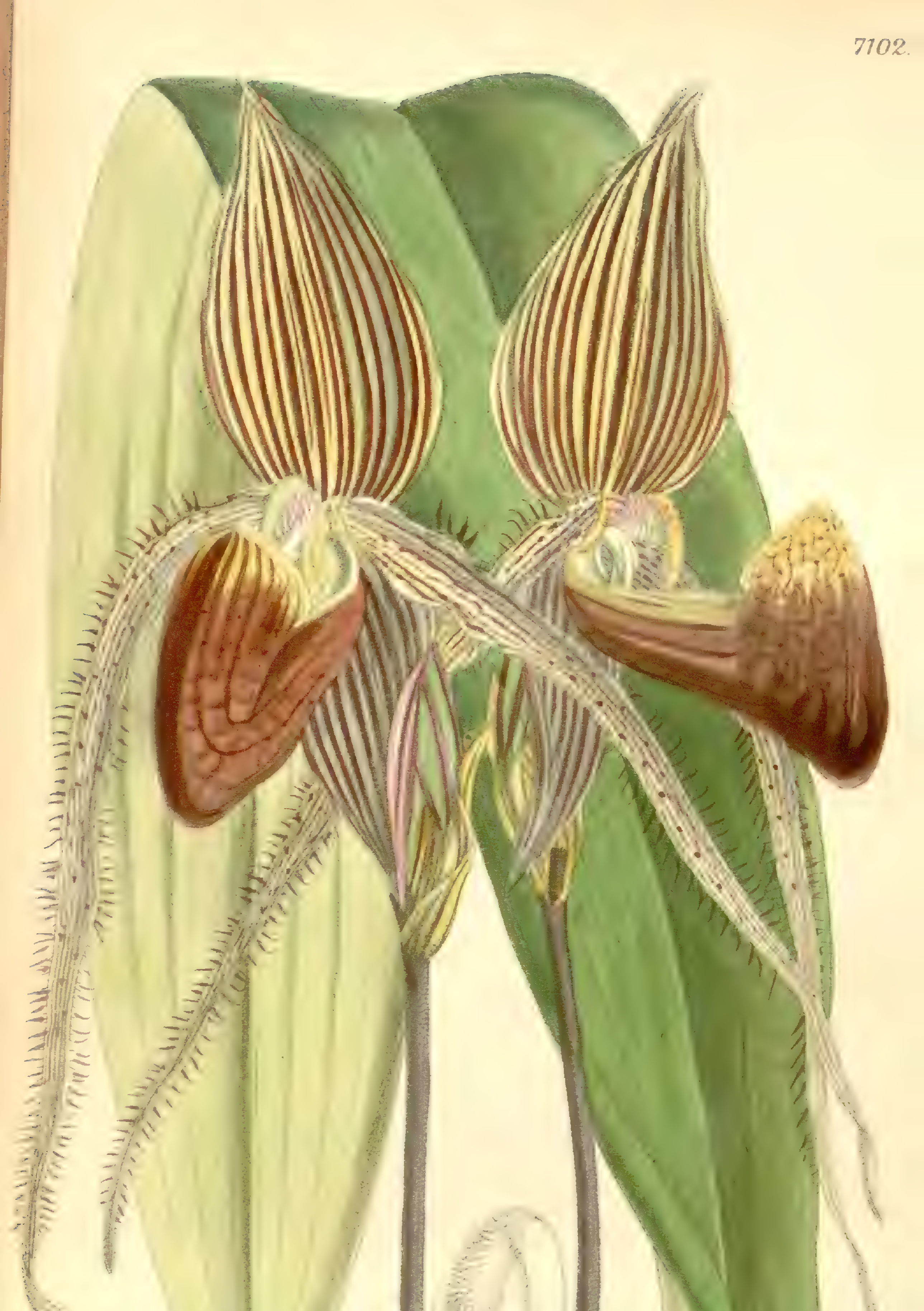
C. palustris differs from other species of the genus in the strongly twisted anthers, in which character it approaches the European genus *Erythræa*, of which the purely South African genus *Chironia* may be regarded as the strict representative, differing chiefly in the stigma, which, though often two-lobed, is never broadly two-lamellate. The spirally twisted stamens and straight style of *C. palustris* have led to its being first sectionally separated by Grisebach in his Monograph of Gentianeæ, as sect. *Pseudo-Sabbatia*, and latterly generically separated by E. Meyer under the name of *Plocandra*. As, however, Bentham has pointed out, the anthers are at length twisted in a true *Chironia*, *C. peduncularis*, and the style is certainly curved in *Plocandra palustris*.

Under *C. peduncularis*, Plate 7047, I have given some statistics of the cultivation of the Cape Chirónias in England, with the names of all known to have been introduced. To these the present species is a very handsome addition. It is a native of the Eastern districts only, extending from Natal northward to the Limpopo or Crocodile River, which bounds the Transvaal on the north in Lat. 22° S., and southward to East London in Lat. 33° S., where Mr. Watson in 1887 collected seeds from plants growing

amongst grass in swampy ground near the sea. From those seeds the specimen here figured and others were raised. They flowered throughout the summer, both in a cold green-house and out of doors. It is singular that, though the district in which Mr. Watson found it has been well explored, no previous collector had found the species so far to the southward by several hundred miles.

DESCR. *Root* perennial. *Stem* twelve to eighteen inches high, stout, terete, green, leafy. *Radical leaves* densely tufted, four to five inches long, very narrowly spathulate, obtuse, thick, narrowed into a broad petiole, bright green; nerves very indistinct; cauline leaves sessile, connate by their bases. *Flowers* numerous, in branching leafy cymes; pedicels stout, usually about as long as the calyx; floral leaves or bracts one to one and a half inches long, linear, acute. *Calyx* half an inch long, narrow; segments linear-lanceolate, acuminate, as long as the tube of the corolla, green. *Corolla* nearly two inches in diameter, bright rose-red; segments elliptic, obtuse, concave. *Stamens* declinate; filaments short, stout, about as long as the linear-oblong yellow strongly twisted anthers. *Ovary* fusiform, terete; style as long, curved; stigma two-fid.—*J. D. H.*

Fig. 1, Tube of corolla and stamen; 2 and 3, stamens; 4, ovary:—*all enlarged.*



Tab. 7102.

CYPRIPEDIUM Rothschildianum.

Native of New Guinea.

Nat. Ord. Orchideæ.—Tribe Cypripedieæ.

Genus Cypripedium, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 634.)

Cypripedium *Rothschildianum*; foliis 1–1½ pedalibus late loratis obtusis glabris, scapo pedali 1–3-floro pubescente luride purpureo, bracteis ovario multo brevioribus spathaceis rubro-purpureo fasciatis, floribus maximis, sepalo dorsali amplo erecto ovato albo lineis ad 15 rubro-purpureis latis striato, sepalis lateralibus in unum dorsali minorem ovato-lanceolatum 9-striatum connatis, petalis sepalo dorsali duplo longioribus albis lineis purpureis 7 striatis ciliatis et sanguineo-maculatis, labello calceiformi apice saccato sacco gibboso et decurvo extus roseo v. albo purpureo venoso intus pallido, staminodio lineari uncinatim recurvo villoso, ovarii viridis costis rubro-purpureis.

C. Rothschildianum, *Reichb. f. in Gard. Chron.* 1888, i. 457 and 554; *Veitch Man. Cypriped.* 45.

C. neo-guineense, *Linden* (*name only*), *Gard. Chron.* 1888, 505 (advertisement).

This superb *Cypripedium* was received for figuring under the above name from Messrs. Sander and Co., of St. Albans, who imported it from New Guinea, and at whose request Professor Reichenbach dedicated it to Baron Ferdinand de Rothschild, a munificent patron of Horticulture. It comes so near the subsequently imported *C. Elliottianum*, O'Brien, also introduced by Messrs. Sander, but which is reported to be a native of the Philippine Islands, that Mr. Rolfe, of the Kew Herbarium, believing the two to be forms of one species, is in doubt under which to place it.

These Malayan *Cypripedia* present several points of great interest, of which one is their variability, which may be taken into consideration with the facility with which they hybridize. Thus of such hybrids Messrs. Veitch in their Manual enumerate no fewer than sixty definite forms, besides less marked ones. Another conclusion arrived at by Messrs. Veitch (Manual, p. 2) is that the individual species throughout the genus, American and Indian, must have at one time existed in much greater numbers than they do now, and that the genus is "suffering gradual extinction." In support of this opinion the

chief arguments are the view of the great antiquity of the genus, held by Mr. Darwin, who, alluding to the anomalous characters of the flowers, regards *Cypripedium* as "the record of a former and more simple state of the great Orchidean Order;" and the great rarity of many of the Malayan species. Now it is not an easy thing to prove the rarity of species in individuals, and in little explored tropical and mountainous islands it is impossible. I have myself felt convinced of the rarity of an Orchid as to which, as I afterwards heard, had I strayed right or left of the locality in which I had collected it, I should have found it abundant over a large area; and I know of more than one noble Orchid (*Arachnanthe Cathcartii* is one), long supposed to be most rare in the country where I first found it, becoming abundant after a change in its environments. This is, as I am informed, the case with our own *C. Calceolus* in one of its English localities, a species cited as an instance of approaching extermination in England. Nor must it be forgotten that *C. Calceolus* inhabits the whole of North Europe and North Asia; just as the American *C. macranthum*, or a very close ally, stretches throughout the entire length of the Himalayan range. If there be any truth in the assumption of the species dying out, Messrs. Veitch's suggestion that this is due to the paucity of insects suitable for their fertilization is a plausible one, and one which may be eventually followed up in the case of *C. Rothschilldianum* by some fever-proof individual who will spend hours on the damp ground in the forests of New Guinea on the remote chance of capturing its insect visitors, and thus discovering if these or their visits are rare.

The subject of the antiquity of a genus or group of plants is a very attractive one, and far too complex to enter on here. Such antiquity, when leading to extinction, is supposed to result in fixity of type, in rarity of individuals, and in the restriction of these in area. In respect of it I may allude to the singular fact that though *Cypripedium* is one of the few tropical genera of Orchids that inhabit both the eastern and western hemispheres, it has not hitherto been found in Africa or Madagascar, countries which have on plausible grounds been held to have been the most recently peopled with plants.—*J. D. H.*

Fig., Column, *magnified*.

Tab. 7103.

Zamia Wallisii.

Native of New Grenada.

Nat. Ord. Cycadaceæ.—Tribe Encephalarteæ.

Genus Zamia, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 447.)

Zamia *Wallisii*; trunco humili crasso cylindraceo glabro, prophyllis triangularibus apicibus productis lanatis, foliis paucis singulatim evolutis, petiolo gracili elongato distanter aculeato primum villosulo demum glabro, foliolis 2–8-jugis petiolulatis amplis ellipticis lanceolatis v. oblanceolatis acuminatis basi acutis rarius cordatis, apices versus obliquos irregulariter dentatis, supra læte viridibus nervis perplurimis immersis, subtus flavo-viridibus, strobilis masculis 2–3-pollicaribus breviter pedunculatis oblongo-cylindraceis, pedunculo lanuginoso, peltis crassis hexagonis tomentosis vertice concavis, antheris subglobosis.

Z. Wallisii, *A. Braun in Monatsb. Berl. Acad. Wissensch.* 1875, p. 376.

Z. ? amplifolia, *Hort. Bull. ex Masters in Gard. Chron.* 1878, vol. ii. p. 810.

Aulacophyllum Wallisii, *Regel Gartenfl.* 1876, p. 143; *Rev. Cycad.* p. 30.

Z. Wallisii is one of three new species discovered in 1873 by Gustav Wallis, when in the employment of Messrs. Veitch as collector in New Grenada, and described by the late Professor Braun of Berlin in the Monthly Proceedings of the Berlin Academy of Sciences. By Regel it has been transferred to his genus *Aulacophyllum*, which he distinguishes from *Zamia* by the leaves appearing in terminal whorls and not one after the other, and by the impressed nerves of the leaflets, characters which in the Genera Plantarum (vol. iii. p. 447) are held to be of no account, and which *Z. Wallisii* does not conform to. The nearest ally of *Z. Wallisii* is *Z. Skinneri*, Warsczw., a native of Guatemala, figured at Tab. 5242 of this work, which has lanceolate prophylla, sessile leaflets, and elongate brown tomentose cones.

The number of known species of *Zamia* is uncertain. In Regel's Review of the *Cycadaceæ*, published in 1876, there are six of *Aulacophyllum*, twenty-two of *Zamia*, and one of *Microcycas* (referable to *Zamia*), and this is about the number estimated in the Genera Plantarum; of these sixteen are now in cultivation at Kew.

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There are magnificent native specimens of the foliage of *Z. Wallisii* in the Kew Herbarium, collected by Kalbreyer, with leaflets eighteen inches long and five to nine broad, and petiolule two and a half to three inches long; they were collected at Cinegetas or Minegetas (a place I do not find in any map or gazeteer) at an elevation of 4-4,500 feet. There is also in the Kew Herbarium a sketch, made by Professor Eichler, of a leaflet received from Veitch, which is oblanceolate, twenty inches long by four and three-quarters broad; and of another seventeen inches by ten and a half, elliptic with a cordate base and very stout petiolule four inches long.

The plant from which our figure was taken was presented by Messrs. Veitch in 1888, and flowered in May, 1889.

DESCR. *Trunk* a span high, cylindric. *Leaves* appearing one by one; petiole two to three feet high, slender, sparsely prickly, young laxly villous, mature glabrous; leaflets two to eight pairs, very variable, from oblanceolate to elliptic, acute, base acute or cordate; petiolule one to four inches; nerves very many, impressed; prophylla broadly triangular, with long stout produced apices, tomentose. *Cones* (male only known) clustered, two to two and a half inches long, cylindric, on a short stout shaggy peduncle; scales shortly stipitate; heads hexagonal, very thick with a concave crown, tomentose; anthers subglobose.—*J. D. H.*

Fig. 1, Scale of cone viewed from above; 2, side view of the same with the anthers before dehiscence; 3, the same with the anthers dehisced; 4, anther: —*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 7104.

SATYRIUM membranaceum.

Native of South Africa.

Nat. Ord. Orchideæ.—Tribe Ophrydeæ.

Genus Satyrium, *Sw.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 629.)

Satyrium *membranaceum*; glaberrimum, robustum, foliis 2 humistratis revolutisque rotundatis acutis carnosis multinerviis, scapi validi vaginis membranaceis infimis apice foliaceis, spica densiflora, bracteis lanceolatis ovaria subæquantibus floribus nutantibus roseis sanguineisve, sepalis lateralibus oblique oblongis acutis patulis, dorsali ligulato apice dilatato, petalis ovato-lanceolatis deflexis ultra medium serrulatis, labello hemispherico apice cuneato reflexo serrulato, calcaribus ovario paullo longioribus gracilibus, columna a medio deflexa, rostello basi utrinque tuberculato, **stigmate subquadrato emarginato v. bifido.**

S. membranaceum, *Swartz in Act. Holm.* 1800, p. 216; *Lindl. Gen. et Sp. Orchid.* p. 216; *N. E. Brown in Gard. Chron.* 1889, vol. i. p. 135.

S. Princeps, *Bolus in Hook. Ic. Plant.* t. 1729.

This beautiful plant has been described by Mr. Bolus (who regarded it as a new species) as one of the handsomest of the genus, with bright carmine flowers deepening to crimson on the back of the lip. In his admirable description, he says that it is allied in habit and floral structure both to *S. carneum* and *membranaceum*, and occupies the same kind of wet sandy dunes near Port Elizabeth as are affected by the former near Cape Town. He distinguishes it from *S. membranaceum* "by its more robust habit, by its much wider lateral sepals, by its obtuse odd sepal, by its emarginate stigmatiferous lobe, but especially by the shape of the rostellum, which has a long and sharp intermediate tooth in front, so that the apices of the glands nearly touch each other, while in *S. membranaceum* the rostellum has a wide semicircular lobe in front, so that the glands are widely separated." Notwithstanding these characters, Mr. N. E. Brown, who has carefully studied the specimens of *Satyrium cucullatum* in Thunberg's Herbarium, upon which *S. membranaceum* was founded, and which were procured at Port Elizabeth

(the habitat of *S. Princeps*), assures me that the two are one species.

S. membranaceum was discovered by Thunberg during his travels in the Cape in 1772—1775, and appears to be a common species in the neighbourhood of Port Elizabeth, where it has been found by many succeeding collectors, extending thence into British Kaffraria. The tubers from which the plant figured here were grown were presented to the Royal Gardens by Mr. J. O'Brien, of Harrow on the Hill; they were planted in loam in a "Cape Bulb House," and flowered in May, 1889.

DESCR. *Stem* one to two feet high, very stout. *Leaves* two, four to six inches long, opposite, radical, spreading horizontally and revolute beyond the middle, rounded ovate, acute, many-nerved, thick and fleshy, bright green above, paler beneath. *Scape* as thick as the little finger, pale brown; sheaths one and a half to two and a half inches long, appressed, membranous, the lower green with a leafy tip. *Spike* three to five inches long, oblong, dense-flowered; bracts ovate-lanceolate, acuminate, about equalling the ovary. *Flowers* nodding, an inch broad across the sepals, bright or pale carmine. *Dorsal sepals* linear-oblong, and with the petals deflexed; lateral spreading and deflexed, oblong, subacute. *Petals* lanceolate, acuminate, serrate beyond the middle. *Lip* hemispheric, with a recurved serrulate triangular tip. *Column* deflexed above the middle; rostellum acute; stigmatic lobe large, broad, emarginate or bifid.—*J. D. H.*

Fig. 1, Flower; 2, top of ovary and column; 3, pollinium:—*all enlarged.*

Tab. 7105.

ARISÆMA Wrayi.

Native of the Malay Peninsula.

Nat. Ord. Aroideæ.—Tribe Arineæ.

Genus Arisæma, *Mart.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 965.)

Arisæma (Pedatisectæ) *Wrayi*; gracile, petiolo scapoque elongatis marmoratis, foliis 2–3 pedatisectis, foliolis 5–9 petiolulatis anguste elliptico-lanceolatis acuminatis basi acutis 3-nerviis supra læte viridibus subtus pallidis nervis prominulis, foliolo intermedio ceteris majore longiusque petiolulato, extimis sæpe multo minoribus sessilibus, scapo folium superante, spathæ erectæ viridis albæ v. pallide lilacinæ tubo 2–3-pollicari subcylindraceo, lamina tubo equilonga suberecta ovato-cordata apice producta, marginibus tubum cingentibus late recurvis, spadice mascula gracillima, appendice decurva dein filiformi pendula spatha longiore, **antherarum glomerulis sparsis subsessilibus.**

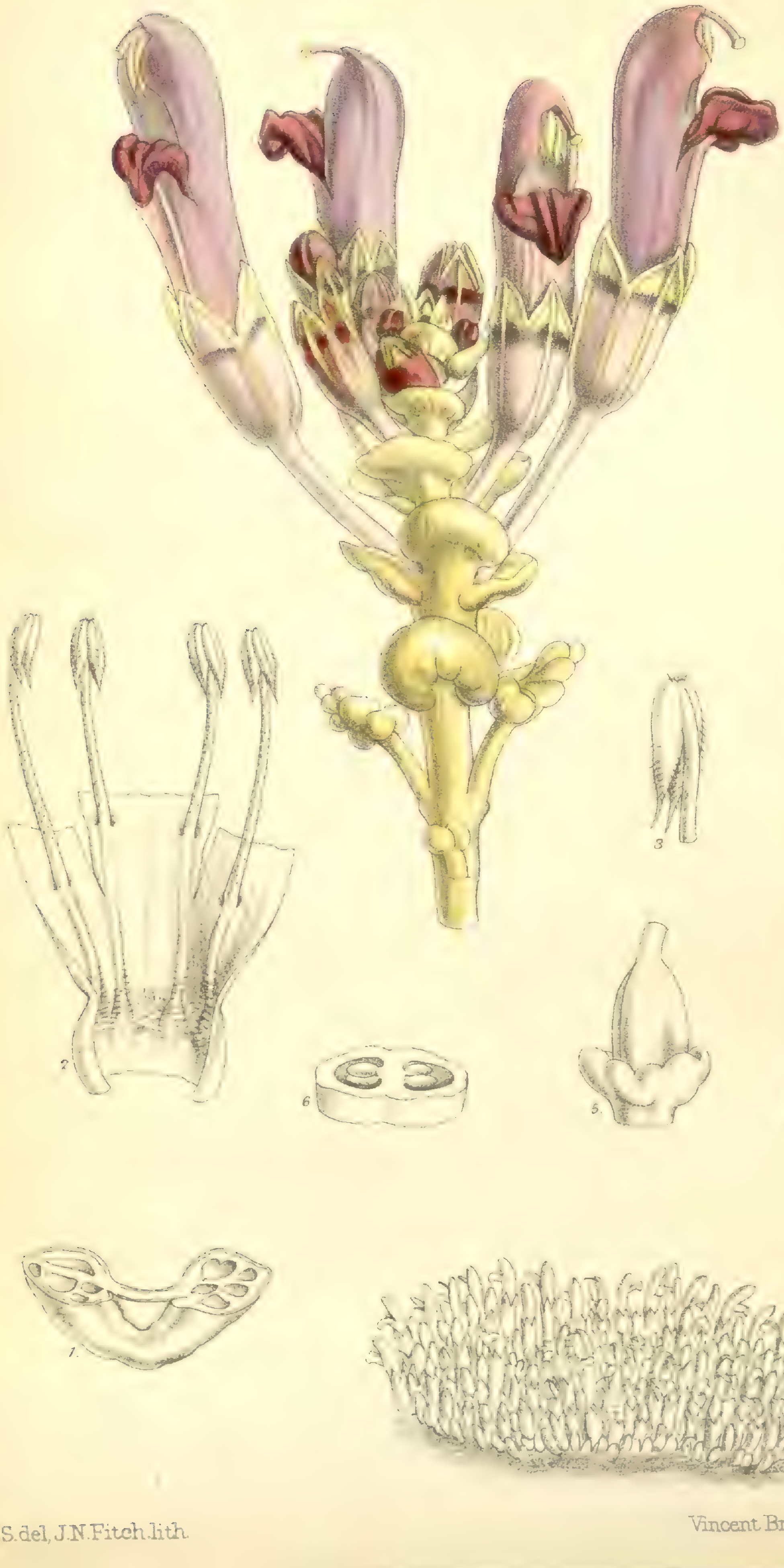
A. Wrayi, *Hemsl. in Journ. Bot.* 1887, p. 205; *N. E. Brown in Gard. Chron.* 1889, vol. ii. p. 136.

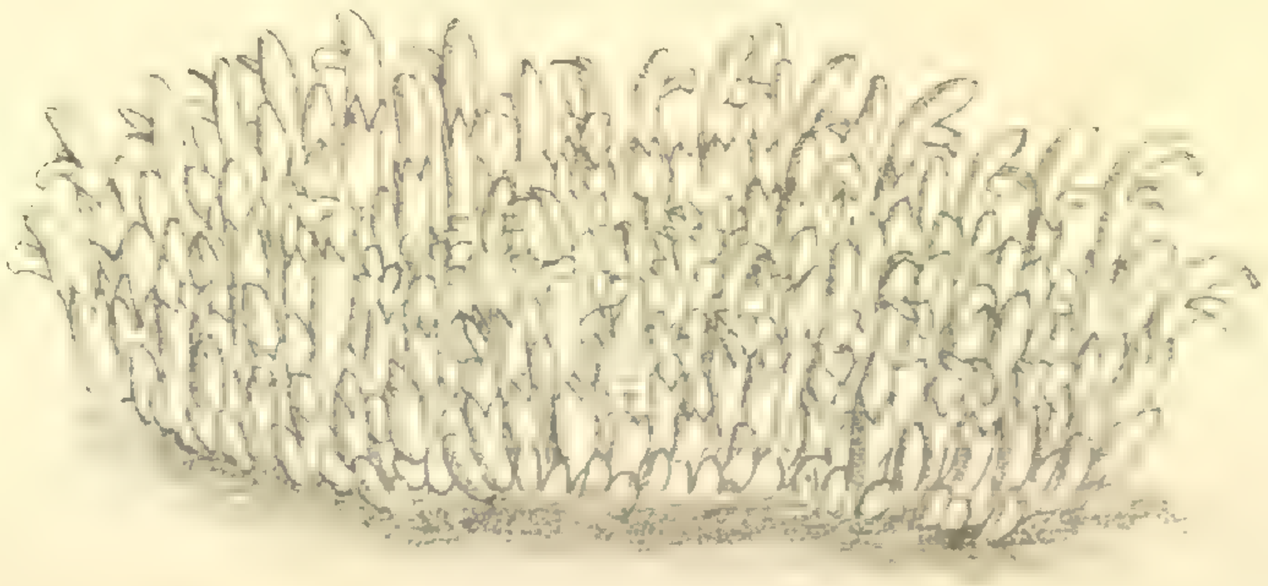
The genus *Arisæma* is a remarkable one amongst Aroids for its wide range in latitude, from the tropics to far into the north temperate zone; and as might be expected from this, the elevation it attains is equally remarkable, from the low-lying equatorial regions of the Malayan Archipelago, to an elevation of 12,000 feet in the Himalaya. And what is very singular in a genus of so wide a distribution, there are no sectional groups of it more characteristic of the colder than of the hotter regions, or *vice versa*. The nearest ally of *A. Wrayi* is the Javanese and Sumatran *A. filiforme*, Blume (Rumph. vol. i. p. 102, t. 28). *A. Wrayi* itself is a native of Perak, where it was discovered by Mr. L. Wray, who in 1884 sent herbarium specimens to Kew from Birch's Hill, with the note that the flowers are pale lilac and white, whereas in the cultivated plant they are pale green. In 1888 the same excellent correspondent sent living tubers to Kew, which flowered in January, 1889, and from one of these the accompanying figure was made.

Descr. *Tubers* as large as a hazel-nut or larger, each giving off a flowering scape and one or three leaves. *Sheaths* one to two inches long, membranous. *Petiole* twelve to

eighteen inches, slender, and as well as the petiolules and scape mottled green and white and dotted with red; leaf-blade pedately five- to nine-partite, leaflets six to eight inches long, narrowly elliptic-lanceolate caudate-acuminate, dark green above, paler beneath, central leaflet largest longest, and with the longest petiolule, being one to one and a half inches long; outermost leaflets, when more than five, much smaller and sessile. *Scape* longer than the leaves, tall, very slender. *Spathe* erect; tube two inches long, cylindric or subcampanulate, pale green white or pale lilac with darker nerves; limb as long as the tube and broader, ovate with a produced lip, slightly arched, darker green, margins at the base and around the mouth of the tube broadly revolute. *Spadix* (male) very slender, rachis white spotted with purple; anthers in scattered shortly stipitate clusters of three to five, globose; appendix slender, narrowed into long decurved and then pendulous filiform tail, about twice as long as the tube of the spathe. *Fruit* red.—*J. D. H.*

Fig. 1, Cluster of anthers; 2, the same after dehiscence:—*both enlarged.*





W. S. del, J.N. Fitch lith.

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Tab. 7106.

LATHRÆA Clandestina.

Native of Europe.

Nat. Ord. Scrophularineæ.—Tribe Euphrasieæ.

Genus Lathræa, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 985.)

Lathræa *Clandestina;* densisissime cæspitosa, caulibus brevibus crassis robustis ramosis squamosis, squamis reniformibus intus lacunosis, floribus racemosis longiuscule pedicellatis strictis erectis, bracteis squamis caulis conformibus, corollæ tubo calyce duplo longiore, labio superiore producto obtuse 3-dentato, inferiore 3-lobo, ovarii placentis 2 pauci-ovulatis, capsula oligosperma, seminibus majusculis angulatis testa crassa lævi.

L. Clandestina, *Linn. Sp. Pl.* 843; *Bertolon. Fl. Ital.* vol. vi. p. 309; *Lamk. Encycl.* t. 551.

Clandestina rectiflora, *Lamk. Ill. Gen.* t. 551, f. 1; *Mutel Fl. Franc.* vol. ii. p. 353; *Reuter in DC. Prodr.* vol. xi. p. 40; *Reichb. Fl. Germ.* t. 1765; *Duchart. in Ann. Sc. Nat. Ser.* 2, vol. xx. p. 145.

Dentaria aphyllos, *Ray Hist. Plant.* p. 1230.

Orobanche sp. 15, *Morison, Plant. Hist. Univ. Oxon.* vol. iii. p. 503, sect. xii. t. 16, f. 16.

The remarkable plant here figured, though usually referred to the same genus as our English Toothwort, *L. squamaria*, has some claims to the retention of the generic name of *Clandestina*, which has been accorded it, in consideration of its racemose inflorescence, erect flowers, longer upper lip of the corolla and angled seeds, in contrast to the numerous minute seeds of *Lathræa* and its spicate secund drooping flowers. Another difference between the two, which I have not found to be noticed elsewhere, is the frequent opposition of the branches of *L. clandestina*, and which strengthens the removal of the genus from *Orobanchaceæ* to *Scrophularineæ*, as was first done by Solms Laubach in his admirable paper on its systematic position.

L. Clandestina is a plant of rather restricted range; it is common in the west and south of France, and especially along hedge banks at the foot of the Pyrenees, where its pale violet flowers have a very handsome appearance, and is found also in Spain, Belgium, and Italy.

March 1st, 1890.

A third species, *L. Rhodopea*, Dingl., is found in Thrace; it has slender stems and long cylindric racemes; a fourth (the only other) is *Clandestina japonica*, Miq., a native of Japan; it has the habit and inflorescence of *L. squamaria*, but the corolla rather of *L. clandestina*.

A plant of *L. Clandestina* was presented to Kew in May, 1888, by Dr. Schumann of the Berlin Herbarium, and was planted by the roots of a willow near the piece of water opposite [illegible] Museum No. 1, where it has already increased threefold, and flowered profusely in April, 1889. In "The Garden," April, 1869, p. 316, it is stated that in the grounds of the Honourable J. Saumarez, of Livermore Park, Bury St. Edmunds, there is a plant of *L. clandestina* established on the roots of a deciduous Cypress. In Europe its favourite hosts are the Willow and Poplar.

Rhizomes densely interlaced, cylindric, fleshy, scaly. *Stems* innumerable, nearly buried in the earth, densely crowded, four to six inches high, cylindric, smooth, fleshy, yellowish brown, scaly; scales half to three-fourths of an inch broad, reniform, semi-amplexicaul, thick, spongy within, the lacunæ having pedicelled glands internally. *Racemes* three to five inches high, many-flowered; flowers two inches long, erect, inserted all round the rachis, pale greyish purple or violet, with a dark purple lower lip; bracts like the scales of the stem; pedicels one inch long or less, very stout. *Calyx* tubular-campanulate, four-cleft above the middle; tube four-angled and four-ribbed; lobes triangular, margins thickened. *Corolla* laterally compressed, tube twice as long as the calyx, compressed, contracted above the base, and there hairy within; upper lip obtusely three-toothed; lower much shorter, recurved, margins incurved. *Stamens* four; filaments puberulous; anthers oblong, cells free and aristate at their bases, hirtellous. *Ovary* seated on an oblique fleshy disk, one-celled, or two-celled when young from the parietal placentas meeting in the axis; style slender, puberulous; stigma capitate, two-lobed. *Capsule* one-celled, two-valved at the apex, placentas linear. *Seeds* four to five, large, testa fungous.—*J. D. H.*

Fig. 1, Transverse section of a scale of the stem; 2, lower part of corolla laid open and stamens; 3, anther; 4, pistil and disk; 5, advanced ovary with enlarged disk:—*all enlarged.*

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Tab. 7107.

PAPAVER RUPIFRAGUM, var. ATLANTICUM.

Native of Morocco.

Nat. Ord. Papaveraceæ.—Tribe Eupapavereæ.

(Genus Papaver, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 51.)

Papaver *rupifragum*, var. *atlanticum*; rhizomate multicauli, caule simplici scapiformi v. ramoso et folioso, foliis plerisque radicalibus una cum caule sepalisque setis longis albidis dense obtectis oblanceolatis grosse dentatis pinnatifidis v. pinnatipartitis, segmentis inæqualibus incisis, alabastris nutantibus, floribus amplis, petalis late cuneato-obovatis miniatis v. aurantiacis, capsula clavata, stigmatibus 6–8.

P. rupifragum (*Boiss. et Reut. Pugill.* p. 6), *Regel Gartenfl.* vol. ii. t. 45.

Var. atlanticum, *Ball in Journ. Bot.* vol. 1873, p. 276; *in Journ. Linn. Soc. Bot.* vol. xvi. p. 313.

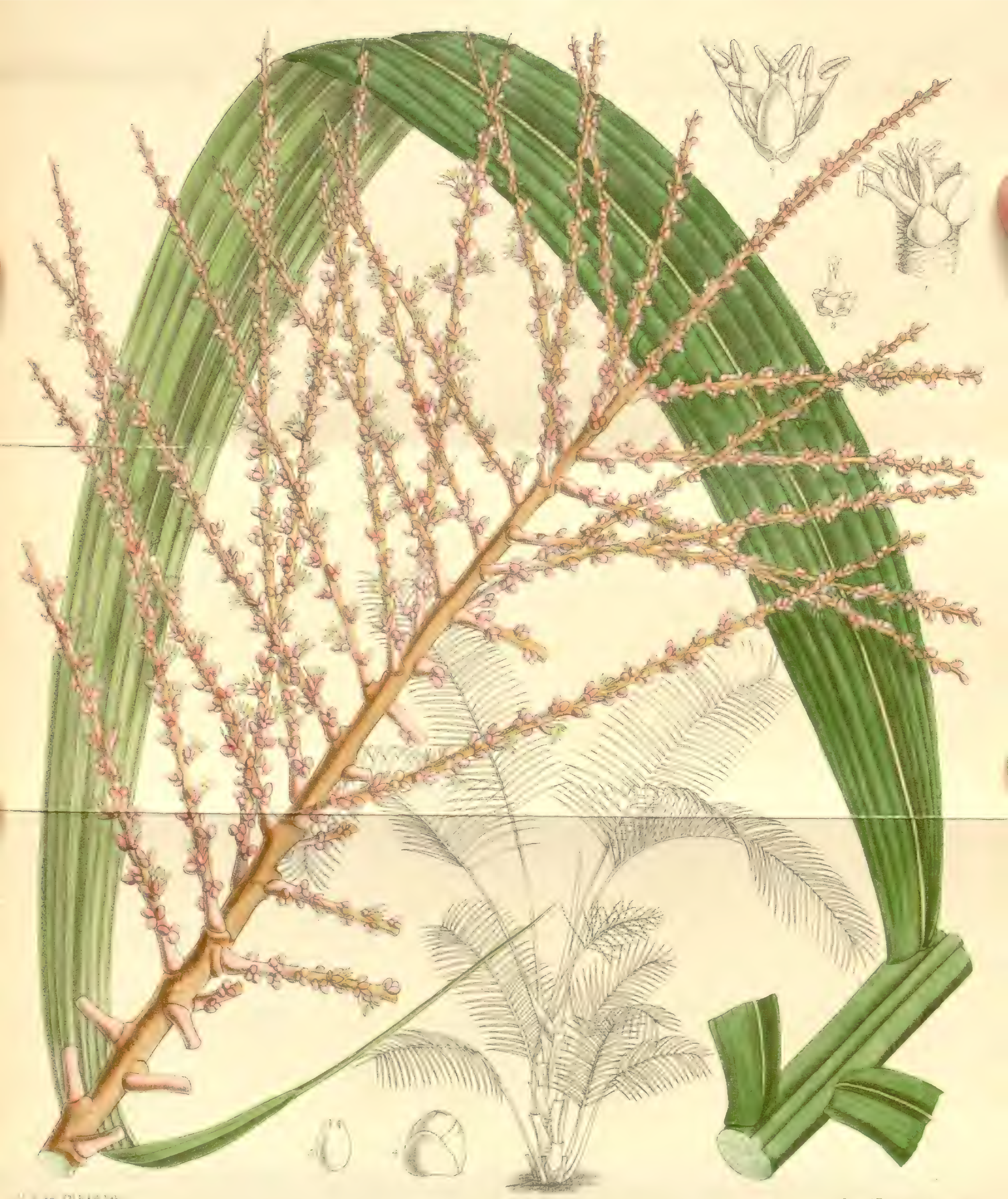
P. atlanticum, *Cosson Ill. Fl. Atlant.* fasc. i. p. 11, t. 6; *Comp. Fl. Atlant.* vol. ii. p. 64.

I follow Mr. Ball in referring this beautiful poppy, without hesitation, to a hirsute variety of Boissier's *P. rupifragum* of Andalusia in Spain, though, as he himself says, it is totally different in aspect, being hoary and everywhere copiously hairy, whilst the Spanish plant is dull green and nearly glabrous. M. Cosson, on the other hand, in his beautiful "Illustrationes Floræ Atlanticæ," has figured the Morocco plant as a distinct species. The species is interesting as showing the close connection between the Floras of the mountains of the south of Spain and Morocco. The only figure of the typical *P. rupifragum* is that given by Regel in his Gartenflora; it is taken from a very poor weak specimen, with five strongly crenate petals described as of a red-gold colour. The var. *atlanticum* was discovered by Mr. Ball and myself in the greater Atlas south of the city of Morocco, at an elevation of 6000 to 7000 feet, growing in dry rocky places; and as it was seen in only two or three localities at considerable distances apart, and there very sparingly, it is probably a scarce plant. It has also been found in Demenet, a province of the Atlas east of the city of Morocco, by collectors sent by M. Cosson. The specimen figured was raised from seed

presented by the late Mr. Ball; it flowered in an open border of the Herbaceous Ground at Kew in the end of May, 1889, and attained a much greater stature than it does in the Atlas.

Descr. Perennial. *Stems* many from the rootstock, one to two feet high, simple or sparingly branched, slender, and as well as leaves and peduncles hispidly setose with long white spreading hairs. *Leaves* radical or radical and cauline, six to eight inches long, oblanceolate, subacute or obtuse, pinnatifidly lobed and lobulate, rarely pinnatipartite, lobules obtuse, bright green above, paler beneath; upper smaller, sessile, lower contracted into a petiole. *Peduncles* three to six inches long, slender; buds drooping. *Flowers* two to three inches in diameter. *Sepals* two-thirds of an inch long, hispid. *Petals* very broadly cuneately obovate, margins undulate, orange-red or scarlet. *Stamens* rather short, not very numerous. *Ovary* shortly clavate; stigmatic rays six to eight, not exceeding in length the crown of the ovary. *Capsule* one to one and a half inches long, clavate, six- to eight-ribbed, glabrous; stigmatic rays dark purple.—*J. D. H.*

Fig. 1, Stamen; 2, capsule:—*both enlarged.*



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Tab. 7108.

PRESTOEA Carderi.

Native of Guatemala.

Nat. Ord. Palmeæ.—Tribe Arecineæ.

Genus Prestoea, *Hook. f.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 899.)

Prestoea *Carderi*; foliorum segmentis lineari-elongatis 7-nerviis in caudam elongatam filiformem attenuatis, spatha interiore elongata gracili stricta coriacea, spadice tomento fulvo-brunneo furfuraceo, floribus minutis roseis glaberrimis, masculis subsymmetricis sepalis minutissimis, petalis ellipsoideis subacutis coriaceo-carnosulis valvatis, fœmineis plerisque solitariis globoso-ovoideis, sepalis hemisphericis concavis, petalisque consimilibus arcte imbricatis, ovario subsymmetrico ovoideo apice obtuse 3-denticulato 1-loculari, ovulo asymmetrico prope basin loculi erecto.

Geonoma Carderi, *Bull List of New &c. Plants*, 1876, p. 9, *cum Ic. xylog.*; *T. Moore in Florist & Pomologist*, 1878, p. 182.

The graceful Palm here figured was discovered in Guatemala by Mr. Carder, a collector in the employment of Mr. Bull, and was advertised for sale at Mr. Bull's establishment in 1876 under the above name. That it is not a *Geonoma* in habit or foliage is obvious, but until it flowered it was impossible to say under what genus of *Areceæ* it should have been placed. From the material now available in the Royal Gardens, where it flowered for the first time in 1889, it may certainly be referred to the subtribe *Oncospermeæ* (of the "Genera Plantarum"), and in so far as can be determined in the absence of fruit, to the West Indian genus *Prestoea*, which differs from nearly all of the subtribes in the petals of the female flower not having valvate tips, and from all but *Hyospathe* in having an erect ovule. The only other certainly known *Prestoea* is the *P. trinitensis* * of Trinidad, which was confounded with *Hyospathe pubigera* in the Flora of the British West Indies; but the *Euterpe montana*, Grah., of the Island of Grenada,

* In the "Genera Plantarum" I gave no specific name to *Prestoea*; which would imply that I retained that of the plant with which it was confounded (*Hyospathe pubigera*). It has been suggested, however, that this would cause confusion, and I therefore now propose that of *trinitensis* for the original *Prestoea*, which is the more germane from the fact of Mr. Prestoe having been Superintendent of the Trinidad Botanical Gardens.

April 1st, 1890.

figured at t. 3374 of this work, is probably another species. It differs from the other two in having a perfectly glabrous spadix. I should add that I have submitted the figure of *P. Carderi* to my friend, Dr. Wendland, of Herrenhausen, whose knowledge of Palms is unrivalled, and he has quite independently arrived at the same conclusion as myself in respect of the genus to which it should be referred.

The Royal Gardens are indebted to Mr. Bull for the plant of *P. Carderi*, which is now planted out in the Palm House, where it flowered in May, 1889.

DESCR. *Caudex* in the Kew plant nearly three feet high (but will probably attain a much greater height), about as thick as the wrist, clothed with the reticulated fibrous short sheaths of the old leaves; base stoloniferous. *Leaves* eight to ten feet long, spreading and arching gracefully, perfectly glabrous; segments very many, all free to the top of the leaf, eighteen to twenty-four inches long by one to one and a half inches broad, linear, gradually narrowed into a straight filiform apex two to three inches long, strongly plicately seven-nerved, dark green above, paler beneath; petiole three to five feet long, dark green and shining, plano-convex towards the base, subtrigonous above it; rachis cylindric with a median ridge above. *Spathes* two, lower short, two-fid; upper very long, three to four feet, by about one and a half in diameter, straight, thickly coriaceous, rigid, smooth, glabrous. *Spadix* shortly exserted, a foot and a half long, suberect, furfuraceously tomentose with a rich pale orange-brown tomentum; rachis strict, rigid, terete; branches six to ten inches long, erecto-patent, strict, rigid, articulate at the base. *Flowers* sessile in threes (a fem. between two males), scattered all round the branches, or solitary and fem. only towards the base of the branches, quite glabrous, pale pink. MALE FL. *Sepals* minute. *Petals* one-eighth of an inch long, free, ellipsoid, concave, valvate. *Stamens* six, filaments longer than the petals; anthers linear-oblong, pistillode acutely three-cleft. FEM. FL. *Sepals* and *petals* semicircular, closely imbricate round the ovary, tips not contracted or valvate. *Ovary* ovoid, nearly straight, top minutely obtusely three-toothed, one-celled; ovule erect from near the base of the cell.—*J. D. H.*

Fig. 1, Clusters of 3 flowers on portion of rachis; 2, male fl.; 3, pistillode; 4, fem. fl.; 5, ovary :—*all greatly enlarged*.

M.S. del. J.N Fitch, lith.

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Tab. 7109.

SICANA SPHERICA.

Native of Jamaica.

Nat. Ord. Cucurbitaceæ.—Tribe Cucumerineæ.

Genus Sicana, *Naud.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 829.)

Sicana *spherica*; ramulis puberulis, foliis ambitu reniformibus glaberrimis punctulatisve 3–5-lobatis basi profunde 2-lobis sinu rotundato, lobis ovatis longe acuminatis integerrimis denticulatisve, cirrhis 3-fidis apicibus dilatatis, pedunculis solitariis, masculo robusto glabro, calycis tomentosi lobis ovatis patentibus, corolla ampla intus tomentosa; fl. masc. filamentis brevissimis liberis glabris, antheris connatis loculis intricatim contortis, ovario cylindraceo, staminodiis obsoletis v. ad setas reductis, fructo globoso glaberrimo indehiscente, seminibus complanatis anguste alatis.

The genus *Sicana* was founded by Naudin on a widely distributed and cultivated American Cucurbit, discovered by Piso in Brazil in the early part of the seventeenth century, known from Mexico to Brazil as the Curuba, but not introduced into Europe till 1862, when seeds were sent to the Jardin des Plantes from Peru. Its strongly-scented Cucumber-like fruit is used in America as a preservative of the attacks of noxious insects, both from the person and from garments, &c. Hitherto only one species, *S. odorifera*, was known, and that certainly known only in cultivation, for I find no clear indication of any native locality, nor are there any but cultivated specimens in our Herbaria. According to Naudin the genus differs from *Cucurbita* in the reflexed calyx-lobes, connate filaments and free anther. To *Sicana* must now, I think, be added the plant here figured, notwithstanding that it differs in its spreading calyx-lobes, and consolidated anthers (characters which would bring *Sicana* closer to *Cucurbita*), as it does from both in the reduction of the staminodes to obscure tufts of bristles at the base of the calyx-tube. From *S. odorifera* it further differs in the globose fruit about the size of an orange.

Mr. Morris informs me that *S. spherica* was found in a ravine in the Blue Mountains, Jamaica, at an elevation of

5000 ft., near the Latimer Cinchona plantations, and was not observed elsewhere. His impression at the time of its discovery was, that (like so many other mountain plants of the Island) it was not indigenous; but on the other hand it so closely resembles the native *Coniosicyos pomiformis*, that it may well be so, and have been overlooked by previous collectors. Mr. Morris sent dried specimens to Kew in 1884, accompanied with dried fruit, seeds, and a sketch of the male flowers by Mr. Hart; these last are smaller than in the plant cultivated at Kew, where plants raised from Mr. Morris' seeds flowered in the Water-lily House first in September, 1886.

Descr. A tall perennial climber, nearly glabrous. *Leaves* three to four inches in diameter, reniform in outline, deeply three- to five-lobed, smooth or punctulate, base cordate with a deep rounded sinus; lobes ovate with long acuminate tips, entire or remotely denticulate, dark green, rather shining. *Tendrils* three-fid, their tips dilated and adherent to supports. *Male flower* solitary; peduncle robust. *Calyx* pubescent, limb campanulate; lobes ovate, subacute, spreading. *Corolla* an inch in diameter; golden yellow, pubescent without and with broad greenish nerves, densely tomentose within; lobes broadly ovate, recurved; abortive ovary oblong. *Filaments* very short, glabrous, free or nearly so; anthers consolidated into a broadly oblong or globose head; cells contortuplicate; staminodes of a few bristles. *Female flower* not seen. *Fruit* globose, about the size of a small orange; pericarp thin, smooth, glabrous. *Seeds* one-third of an inch long, oblong, flat, with a narrowly winged border; testa smooth, crustaceous. —*J. D. H.*

Fig. 1, Top of ovary of male fl. with stamens and staminodes; 2, transverse section of the abortive ovary:—*both enlarged.*

M.N. del, J.N.Fitch lith.

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Tab. 7110.

PELIOSANTHES albida.

Native of Malay Peninsula.

Nat. Ord. Hæmodoraceæ.—Tribe Ophiopogoneæ.

Genus Peliosanthes, *Andr.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 678.)

Peliosanthes *albida*; foliis ad rosulam 4–5 lanceolatis petiolo facie subplano dorso semitereti, pedunculo brevi, racemo elongato laxo angusto, pedicellis brevibus solitariis deflexis, bracteis lanceolatis, perianthio albido segmentis exterioribus ovatis interioribus obovatis, filamentis in tubum brevem incurvatum coalitis, antheris parvis globosis, ovario semi-infero, ovulis in loculo circiter 5.

Of the curious genus *Peliosanthes* ten species are now known, only two of which have been figured long ago in the Botanical Magazine, viz. *P. Teta*, tab. 1302, and *P. humilis*, tab. 1532. The fruit is like that of *Ophiopogon* and *Sansevieria*, with the pericarp bursting in an early stage and exposing the single berry-like seed. The genus inhabits the tropical forests of India, and extends to Western China and the Malay Peninsula. The present species is marked by its narrow leaves, white flowers, and very short deflexed pedicels. It was sent from Penang in July, 1885, to Kew Gardens by Mr. C. Curtis, Assistant Superintendent of the Garden and Forest Department, and was flowered at Kew for the first time in the summer of 1889.

Descr. *Produced leaves* four or five to a tuft; petiole stiffly erect, half a foot long, nearly flat on the face, semiterete on the back; blade lanceolate, about a foot long, an inch and a half or two inches broad at the middle, bright green, moderately firm in texture, narrowed gradually to both ends, with seven or eight strong main vertical ribs, with a fainter one midway between each pair, connected by distinct cross-veinlets. *Peduncle* short, with many small lanceolate bract-leaves. *Raceme* lax, subspicate, six or eight inches long; pedicels solitary, very short, deflexed; bracts lanceolate. *Perianth* whitish, a quarter of an inch

in diameter; outer segments ovate, inner obovate. *Filaments* connate in a short incurved tube; anthers subglobose, minute. *Ovary* globose, half-inferior; ovules about five in a cell; stigma sessile, three-lobed.—*J. G. Baker.*

Fig. 1, Bud with bract; 2, expanded flower; 3, flower with segments cut away; 4, staminal type with a single anther; 5, vertical section of staminal tube and ovary; 6, transverse section of ovary:—*all enlarged.*

M.S. del, J.N. Fitch lith.

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Tab. 7111.

IRIS orchioides.

Native of Central Asia.

Nat. Ord. Irideæ.—Tribe Moræeæ.

Genus Iris, *Linn.*; (*Benth. et Hook.f. Gen. Pl.* vol. iii. p. 686.)

Iris (*Juno*) *orchioides*; bulbo magno ovoideo tunicis membranaceis brunneis, caule oligocephalo semipedali vel pedali, foliis productis 5–6 lanceolatis acuminatis viridibus facie canaliculatis margine haud incrassatis, spathæ valvis lanceolatis pallide viridibus haud inflatis, pedicello brevi, perianthii tubo elongato, limbo sæpissime citrino interdum oculato vel lilacino tincto, segmentis exterioribus laminâ patula oblonga cristata ungue cuneato haud auriculato, segmentis interioribus parvis deflexis oblongis ungue angusto canaliculato, styli cristis subdeltoideis magnis.

I. orchioides, *Carriere in Rev. Hort.* 1880, p. 337, fig. 68; *Foster in Gard. Chron.* 1889, vol. i. p. 588.

I. caucasica, *vars.* oculata & major, *Maxim. in Bull. Acad. Petrop.* vol. x. pp. 688, 689.

This species is nearly allied to *Iris caucasica*, which differs from it by its dwarfer habit, leaves furnished with a thickened horny border, inflated spathes, and paler yellow flowers; with the crest of the blade of the outer segments serrated, and the sides of the claw expanded at the top into a transparent auricle. It inhabits the mountains of Turkestan and Bokhara, attaining an elevation of seven thousand feet above sea-level. It varies greatly in the colour of the flower, the type being plain bright yellow, and varieties furnished with a dark spot at the base of the blade or the bladė altogether lilac, except a yellow spot round the central crest. It has been grown for many years in English gardens under the names of Maximowiez above cited. Our description is made partly from plants that have flowered at Kew, and partly from specimens sent by Professor Foster and Mr. H. J. Elwes. Our drawing was made from a plant flowered by the latter at Cirencester last April.

Descr. *Root-fibres* many, cylindrical. *Bulb* ovoid, an inch or more in diameter; tunics brown, membranous. *Stem* half a foot to a foot or more long, bearing two or

three flowers, sessile in the axils of the upper leaves. *Leaves* five or six, lanceolate, acuminate, six to nine inches long at the flowering season, bright green, with a channelled face, and without any distinctly-thickened horny border. *Spathes* one-flowered, two inches or more long; valves not inflated, lanceolate, pale green; pedicel very short. *Perianth-tube* slender, cylindrical, an inch or more long; limb in the type as figured bright yellow, two inches long; outer segments with a spreading oblong blade half an inch broad, with an entire orange crest running down the lower part; claw narrowed gradually from the apex to the base, without any transparent auricles; inner segments drooping between the bases of the outer, with a small oblong blade and a long channelled claw. *Style-branches* above an inch long; crests large, subdeltoid. *Anther* linear, shorter than its filament. *Capsule* and *seeds* not seen.—*J. G. Baker.*

Fig. 1, Front view of anther; 2, back view of anther; 3, apex of style, with crests:—*all enlarged.*

M.S.del, J.N.Fitch, lith.

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Tab. 7112.

VANDA Kimballiana.

Native country unknown.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Vanda, *Brown*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 578.)

Vanda (*Euvanda*) *Kimballiana*; caule elongato, foliis elongatis teretibus profunde canaliculatis acuminatis, pedunculo elongato, racemo multifloro, floribus albis labello roseo, sepalo dorsali petalisque obovato-spathulatis, sepalis lateralibus falcatis decurvis dorsali multo majoribus, labelli lobis lateralibus parvis incurvis corniformibus terminali orbiculato emarginato eroso basi lamellato, calcare labello æquilongo.

V. Kimballiana, *Reichb. f. in Lindenia*, t. 204; *J. O'Brien in Gard. Chron.* 1889, p. ii. pt. 165; *Rolfe l. c.* p. 294, fig. 50.

This beautiful species was introduced into England by Messrs. Hugh Low and Co., but from what country has not been divulged. Its nearest ally is said to be *V. Amesiana*, Reichb. f. (Warner's Orchid. Alb. vol. vii. t. 296), which is a reputed native of India. It is indeed very nearly allied to that plant, differing notably in the very narrow leaves, so narrow indeed as to be terete in outline though deeply channelled, and in the corniform side-lobes of the lip. From the terete-leaved *V. teres* and *V. Hookeriana* it widely differs in floral characters. The name *Kimballiana* was given by Professor Reichenbach in compliment to W. S. Kimball, Esq., of Rochester, U.S.A., a noted Orchidophilist. The specimen here figured was lent for figuring by Messrs. Low in September of last year.

Descr. *Stem* about six inches long in the specimen figured (but probably scandent and attaining a great length), as thick as a goose-quill, clothed with short brownish, green, mottled leaf-sheaths; roots very long and stout. *Leaves* six to ten inches long, gradually narrowed from the base to the acuminate tip, terete but deeply channelled above, green mottled with brown, young subulate. *Peduncle* six to eight inches long, rather slender, and as well as the rachis of the raceme yellow-green with short red streaks. *Raceme* eight inches long, pendulous,

ten- to fifteen-flowered; bracts very small; pedicel with ovary an inch long; flowers two inches in diameter, pure white except the lip, the side lobes of which are yellowish speckled with red, and the midlobe rose-coloured with darker longitudinal veins. *Dorsal sepal* obovate-spathulate, obtuse; lateral very much larger, more oblong, strongly falcate, obtuse, decurved. *Petals* like the dorsal sepal, but rather larger. *Lip* smaller than the lateral sepals, slightly recurved; side lobes like small horns, acute, recurved; midlobe orbicular, notched at the apex, lamellate at the base; margins erosely fringed; spur as long as the midlobe, narrow, slightly curved, obtuse. *Column* very short, white; anther beaked; pollinia two, obovoid; strap thrice as long as the pollinia, dilated upwards; gland rather small.—*J. D. H.*

Fig. 1, Column and portion of lip showing the side lobes, lamellate base of the midlobe and base of the spur; 2, column with anther; 3 and 4, pollinia with strap and gland:—*all enlarged.*

M. ' del. J.N.Fitch lith

Tab. 7113.

EREMURUS AURANTIACUS.

Native of Central Asia.

Nat. Ord. Liliaceæ.—Tribe Asphodeleæ.

Genus Eremurus, *M. B.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 787.)

Eremurus *aurantiacus;* rhizomate ovoideo, fibris radicalibus cylindricis carnosis, foliis pluribus linearibus glabris sordide viridibus facie canaliculatis dorso acute carinatis, pedunculo stricto tereti, racemo denso cylindrico, pedicellis strictis tenuibus apice articulatis, bracteis lineari-subulatis, perianthio citrino segmentis viridi carinatis exterioribus oblongis interioribus obovatis, filamentis filiformibus perianthio duplo longioribus antheris parvis oblongis luteis, fructu globoso, seminibus in loculo 2–3 triquetris sordide brunneis anguste alatis.

E. aurantiacus, *Baker in Journ. Linn. Soc.* vol. xv. p. 285; vol. xviii. p. 102; *Regel Descr. Nov. Pl.* fasc. ix. p. 34; *Gartenfl.* 1884, p. 289, fig. 1168 b–h.
E. Bungei, *var.* stenophyllus, *Boiss. Fl. Orient.* vol. v. p. 324.

This fine Asphodel was first described as a form of *E. Bungei* from imperfect specimens gathered by Griffith in Afghanistan in 1840. It was re-found in abundance by Dr. Aitchison in 1879 during the Kurrum Valley expedition. He reported that it grew abundantly at an elevation of 7000 to 9000 feet above sea-level, and that the young leaves were extensively used as a cooked vegetable. Probably this is the plant that was written about in the newspapers as a gigantic asparagus. He gathered it again in plenty in 1875, when attached as naturalist to the Afghanistan Delimitation Commission, and we have also received it from Cabul, from Colonel Collett, from Gilgit, from Dr. Giles, and from Bokhara and Turkestan from Dr. Albert Regel. The Persian *E. Bungei*, Baker, figured Gartenflora, tab. 1168, fig. a, is not distinguishable from *aurantiacus* in dried specimens, but when alive has less acutely-keeled leaves, root-fibres tapering upwards, orange-yellow flowers and red-yellow anthers. Our drawing was made from a plant that flowered in the open border in Kew Gardens in July, 1886.

Descr. *Rootstock* ovoid, surrounded by membranous ovate scale-leaves, white veined with brown, and outer

tunics slit up into fine fibres ; roots many, long, cylindrical, fleshy. *Leaves* very numerous, all radical, linear, dull green, glabrous, a foot and a half long, very narrow in the wild plant, but reaching a width of half an inch or more at the middle when cultivated, channelled down the face, acutely keeled. *Peduncle* terete, stiffly erect, rather longer than the leaves. *Raceme* dense, cylindrical, sometimes a foot or more long; pedicels slender, articulated at the apex, spreading or rather ascending, finally an inch or more long; bracts linear-subulate. *Perianth* lemon-yellow; segments permanently connivent at the base, faintly keeled with green; outer oblong, inner obovate. *Stamens* twice as long as the perianth; filaments filiform; anthers small, oblong, yellow. *Ovary* globose; style longer than the filaments. *Capsule* globose, a third of an inch in diameter. *Seeds* triquetrous, dull brown, narrowly winged, two or three in a cell.—*J. G. Baker.*

Fig. 1, Whole plant, *reduced in size;* 2, leaves; 3, raceme, *life-size;* 4, outer segment of the perianth; 5, inner segment of the perianth; 6, front view of stamen; 7, back view of stamen; 8, pistil, *all enlarged;* 9, fruit, *natural size;* 10, fruit, *enlarged;* 11, seed, *enlarged.*

M.S. del, J.N. Fitch. lith.

Vincent Brooks Day & Son Imp.

Tab. 7114.

ABIES brachyphylla.

Native of Japan.

Nat. Ord. Coniferæ.—Tribe Abietineæ.

Genus Abies, *Juss.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 441.)

Abies *brachyphylla*; arbor excelsa, ramulis glabris, foliis ¾–1 poll. longis linearibus obtusis v. subemarginatis subtus glaucis demum concoloribus, costa supra depressa subtus prominula, canalibus resiniferis 2 inter costam marginesque mediis, amentis masculis cylindraceis obtusis, bracteis apice recurvis calcariformibus, antheris subglobosis, amentis fœm. maturis 3–4 poll. longis cylindraceis obtusis, bracteis obovato-oblongis truncatis denticulatis, squamis horizontalibus bracteas longe superantibus transverse oblongis denticulatis basi cuneatis, seminis ala oblique cuneata truncata.

A. (Picea) brachyphylla, *Maximov. Mel. Biol.* vol. vi. p. 23; *Masters in Gard. Chron.* 1879, vol. ii. p. 556, fig. 19, and 1885, vol. ii. p. 151, fig. 30; *in Journ. Linn. Soc.* vol. xviii. p. 515, fig. 14; *Franch. et Sav. Enum. Fl. Jap.* vol. i. p. 437.

? A. pinnosa, *Hort. Veitch.*

A. Veitchii, *Hort.* (*ex part.*).

Picea brachyphylla, *Gord. Pinet. Ed.* 2, p. 201.

Pinus brachyphylla, *Parlat. in DC. Prodr.* vol. xvi. pars 2, p. 424.

P. firma, *McNab in Proc. Royal Irish Acad.* 1876, p. 686 (*non* Ab. firma, *Sieb. et Zucc.*).

A native of the mountains of Japan at elevations of 5-6000 feet, first described by Maximovicz in 1866, though previously distributed under the name it bears by that botanist. Its distribution is a wide one, extending to Saghalien in the north, to Jesso and Nipon in the south; in which latter place it inhabits the flanks of Fusigama. It was introduced by Mr. Maries when collecting for Messrs. Veitch in the year 1870, and has proved to be perfectly hardy, having stood the winters of Denmark. According to Dr. Masters, who has kindly provisionally certified the drawing, it is doubtful whether *A. brachyphylla* is distinct from *A. homolepis* of Siebold and Zuccarini, an imperfectly described species which has acute leaves, and from *A. Harryana*, McNab; and it is certainly one of the plants cultivated under the name of *A. Veitchii*, Lindley, and *P. pinnosa*, Hort. Veitch. In its young state it exactly accords

with *P. firma*, Sieb. and Zucc., and its habit when full grown, according to Mr. Maries, is that of *P. bifida*, Sieb. and Zucc. No one but a botanist traversing the Islands of Japan with an eye especially directed to its Silver Firs can determine whether species or varieties or synonyms are represented under the above names; and a reference to the remarks made as to its European and Western Asiatic congeners under tab. 6992 (*Abies Nordmanniana*) shows that the difficulty of limiting the species of this genus is not confined to its Eastern Asiatic members.

The specimen figured was taken from a young plant eight feet high, growing on the mound near the Water-lily House in the Royal Gardens, in 1887, since which the tree has not coned.

Descr. A tree fifty or sixty feet high, with spreading branches; bark rough, whitish. *Leaves* crowded, sessile, obscurely distichous, spreading and up-curved, one-half to one inch long, linear-oblong, obtuse, tip rounded or notched; young glaucous beneath; midrib depressed above, prominent beneath, margins subrecurved, resin-canals midway between the margin and midrib. *Male catkins* three-quarters of an inch long, cylindric, obtuse; anthers subglobose; bracts obtuse or bifid. *Cone* three to four inches long, cylindric, obtuse at both ends; bracts obovate denticulate, much shorter than the transversely oblong denticulate scales. *Seed* with the obliquely wedge-shaped wing nearly as long as the scale.—*J. D. H.*

Figs. 1 and 2, Front and back view of leaves; 3, scale and bracts; 4, seeds and scale; 5, seed; 6, transverse section of leaf, showing the resin-canals:—*all enlarged.*

del, J N Fitch lith

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Tab. 7115.

PASSIFLORA Miersii.

Native of Brazil.

Nat. Ord. Passifloraceæ.—Tribe Passifloreæ.

Genus Passiflora, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 810.)

Passiflora (Grenadilla) *Miersii;* glaberrima, gracilis, foliis breviter petiolatis integris oblongo-lanceolatis ovatisve subpeltatis obtusis apiculatisve, subtus subsanguineis nervis viridibus reticulatis marginibus cartilagineis, petiolo glanduloso, stipulis foliaceis petiolum subæquantibus oblongis basi acutis mucronatisve paucidentatis convexis, bracteis minutis rarius foliaceis, floribus solitariis axillaribus, pedunculo petiolo duplo longiore apicem versus articulato, bracteis parvis v. majusculis linearibus, floribus stellato-campanulatis, calycis tubo brevi ventricoso lobis oblongis obtusis, petalis lineari-oblongis acutis undulatis albis, corona 4–5-seriata, filis albis purpureo-fasciatis, externis petalis $\frac{1}{3}$ brevioribus, interioribus brevibus erectis apicibus capitellatis 2–3-fidisve, intimis in tubum basi connatis, columna petalis multo breviore ovarioque glabris, filamentis antheris paullo brevioribus.

P. Miersii, *Masters in Mart. Fl. Bras.* vol. xiii. pars 1, p. 599, t. 117, fig. 1; *in Gard. Chron.* 1888, vol. ii. p. 352, fig. 46.

A very graceful species of Passion-flower, discovered by Burchell in the Minas Geraes province of Brazil, but found also in that of Rio de Janeiro, where the late Mr. Miers, whose name it bears, collected it in the Organ Mountains. It belongs to the section Grenadilla, and its nearest ally that is figured in this work is probably *P. amabilis* (Tab. 4406). The Royal Gardens are indebted to Dr. Masters, F.R.S., for the plant from which the drawing was taken. It was received in 1888, and grew with great rapidity in the Water-lily House, flowering in profusion in the month of July.

Descr. A very slender graceful glabrous climber; branches as thick as a sparrow's quill, terete, smooth. *Leaves* two to three inches, long-petioled, from ovate or elliptic-ovate to oblong-lanceolate obtuse or apiculate, the broad subpeltate base rounded, quite entire, bright green above, beneath purplish red and reticulated with green veins; petiole one-third to half an inch long, slender,

sparsely glandular; stipules two, as long as the petioles, foliaceous, very convex, base rounded, apex apiculate or acuminate. *Tendrils* very slender. *Flowers* solitary, two inches in diameter; stellately spreading; peduncle slender, longer than the petiole. *Calyx* green, tube depressed-spherical, base intruded; lobes linear-oblong, with a setaceous spinule beneath the rounded apex. *Petals* as long as the sepals, linear, subacute, white; undulate. *Corona* of three to four series of threads, that are white banded with violet; outer series one-third shorter than the petals, subacute; inner short, erect, tips clubbed simple or two- to three-fid, dark violet; innermost combined below into a membranous tube. *Column* about twice as long as the inner corona, speckled with purple, as are the filaments, which are equal in length to the linear-oblong anthers. *Styles* longer than the filaments, stigmas globose.—*J. D. H.*

Fig. 1, Section of calyx and corona; 2, threads of inner corona; 3, portion of tube and threads of innermost corona:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 7116.

BERBERIS virescens.

Native of the Sikkim Himalaya.

Nat. Ord. Berberideæ.—Tribe Berbereæ.

Genus Berberis, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 43.)

Berberis *virescens*; frutex ramosus, ramis divaricatis teretibus v. subsulcatis, cortice brunneo nitido, foliis parvis obovatis obtusis apiculatisve enerviis integerrimis v. distanter spinuloso-dentatis, subtus pallidis vix glaucescentibus, aculeis tripartitis gracilibus, floribus parvis fasciculatis v. in racemos paucifloros subsessiles dispositis sulphureis v. pallide viridibus, sepalis ovatis, petalis spathulatis, baccis gracile pedicellatis parvis linearioblongis oblongo-lanceolatisve leviter compressis coccineis monospermis, **stigmate parvo disciformi subsessili.**

Berberis sp., *Hook. f. et Thoms. Flor. Ind.* 229; and *Fl. Brit. Ind.* vol. i. p. 112; **sp. 2 ad calcem generis.**

? B. Belstaniana, *Hort.*

It is with great hesitation that I propose as a new species a Himalayan Barbery, especially considering the number and great variability of those already known, and the difficulty of discriminating and defining their forms. There is, however, this to be said for *B. virescens*, that I recognized it when travelling in Sikkim in 1849 as very different from any I had collected in that region; and when describing the genus for the Indian Flora, I refrained from naming it in the absence of fruit, and merely mentioned it at the end of the genus. No doubt I sent seeds of it to Kew, for I find a note attached to the native specimens in the Herbarium, to the effect that it flowered in the Royal Gardens in July, 1855. Unfortunately no specimens of the latter were preserved, and it was not till quite lately (in 1887) that the species reappeared, when specimens were sent to be named by Thomas Acton, Esq., of Kilmacurragh, Rathdrum, Ireland, since which it has been received by Sir Charles Strickland, Bart., of Hildenley, Maldon, which were from plants raised (as were Mr. Acton's) from seeds sent from Sikkim by Mr. Elwes; and also from the Gardens of the Royal Horticultural Society at Chiswick, the latter with a note that wasps eat the flowers.

As a species *B. virescens* is perhaps most nearly allied to *B. aristata*, and in the small leaves to the varieties *cratægina* and *cretica* of *B. vulgaris*, which are also natives of the Himalaya. And indeed there are in the

Kew Herbarium specimens considered by Dr. Thomson and myself as forms of the latter plant, from Sikkim and other parts of the Himalaya, which I am now disposed to think should be referred to *B. virescens*. From the normal forms of *B. aristata* it differs in the small leaves, fascicled or very shortly corymbose flowers, their small size, pale yellow or greenish colour, and in the small narrow long-pedicelled fruits which have a tendency to be narrowed upwards, as also in the solitary seed. Mr. Nicholson, who has aided me in the examination of *B. virescens*, has drawn my attention to a Berbery cultivated at Kew and elsewhere in England and on the Continent, which has similarly small pale flowers, but rather larger spinulose-toothed leaves more strongly nerved, and larger red or black berries with one much larger seed. I made no note of the colour of the flower when I gathered the plant in Sikkim, but as I was then on the march, and this was during the rainy season, when I lost a large proportion of my collections from inability to get them preserved speedily, I may well have overlooked this important point. The exact habitat of my specimens is the Lachen Valley, at an elevation of 9000 feet above the sea, and the date May 28, 1849. Other specimens are from Bhotan, collected by Griffith, and there is a similar plant from the N.W. Himalaya. Mr. Acton's flowering specimens were received on June 14, 1887, and again on May 24, 1888, his fruiting ones on October 19; and from these the figures in this Magazine are taken.

Descr. A shrub with spreading strict divaricating branches; branchlets terete or slightly grooved; bark brown, shining. *Leaves* two-thirds to one and a quarter inches long, tufted, obovate, tip rounded or apiculate, quite entire on the larger spinulose-toothed; pale green above, paler subglaucous beneath; nerves very inconspicuous except in older leaves. *Thorns* tripartite, very slender. *Flowers* small, one-third of an inch in diameter, in fascicles or very short racemes, sulphurous or greenish yellow. *Sepals* ovate. *Petals* spathulately obovate. *Berry* half an inch long, narrowly oblong, or narrowed upwards, compressed, scarlet or black, one-seeded; stigma small, disciform, subsessile.—*J. D. H.*

Fig. 1, Flower; 2, petal; 3, stamen; 4, ovary:—*all enlarged.*

M.S del. J.N Fitch in tin.

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Tab. 7117.

PRIMULINA sinensis.

Native of China.

Nat. Ord. Gesneraceæ.—Tribe Cyrtandreæ.

Genus Primulina, *Hance in Brit. Journ. Bot.* xxi. (1883) 169.

Primulina Tabacum, *Hance l. c.; Clarke in DC. Monogr. Phanerog.* vol. i. p. 288 (*nomen*); *Hemsley in Journ. Linn. Soc. Bot.* vol. xxvi. p. 229; ***Dewar in Gard. Chron.* 1889, vol. ii. p. 357, f. 52.**

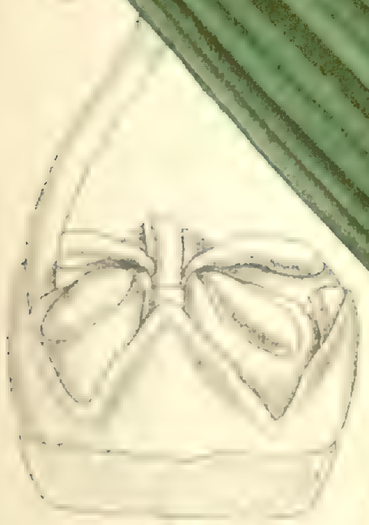
With the habit and foliage in most respects of a *Primula*, this singular plant possesses all the botanical characters of the family of *Gesneraceæ*, and, as Mr. Clarke has pointed out to me, its nearest allies are *Klugia*, *Loxonia*, and *Rhynchostylis*—from all which it differs in the salver-shaped corolla with nearly equal lobes. In Dr. Hance's description of the genus, the disk is said to be absent; but it is really very highly developed as two large cuneately quadrate fleshy bodies at the base of the ovary. Mr. Hance describes *Primulina* as very delicate and difficult to rear in cultivation, and says of it that it is so wonderfully like a *Primula* even when in blossom, that it was only dissection which showed him that it was a *Gesneracea*. Mr. Henry, who communicated it to him, informed him that when alive the glandular pubescence exhales a powerful odour of tobacco, which it communicates to the hands of any one touching it, and that it is universally known to the natives by the name of *Shek-in*, that is, Rock Tobacco.

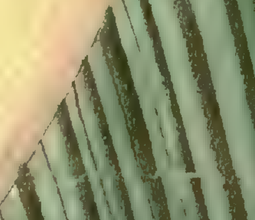
The figure here given is taken from a plant that flowered in the Royal Gardens, aided by Herbarium specimens communicated by Mr. Ford, and was raised from seed received from the Hong Kong Botanical Garden in 1887. It flowered in July, 1889, but did not seed. It is a native of Kwang Lung, Tali, on the Lienchau river, 270 miles from Canton.

Descr. A low glandular-pubescent herb; rootstock very short, emitting thick fibrous roots. *Leaves* all radical, crowded on the rootstock, petioled, rather fleshy, orbicular

in outline, two to five inches in diameter, obtuse, base cordate, margins obtusely lobulate, strongly waved and incurved when young, pale green, pilose above, glandular beneath, penninerved, nerves few impressed; petiole one to three inches long, stout, broadly winged, wing waved. *Scapes* equalling or shorter than the leaves, many-flowered, glandular-hairy; flowers in umbelliform incurved cymes, subsecund when young, shortly pedicelled; involucral bracts two, half an inch long, linear-oblong, obtuse, spreading. *Calyx* one-third of an inch long, narrow, tubulose, terete, glandular-hirsute, with brown hairs, subequally five-partite, segments lanceolate, erect. *Disk* of two free cuneately quadrate fleshy segments. *Corolla* salver-shaped, glandular-pubescent or tomentose without and within; tube longer than the calyx; limb one-half to three-fourths of an inch broad, unequally five-lobed; lobes spreading, obovate-oblong, obtuse, obscurely crenate, ciliate, white with very broad violet-purple borders, and a broad purple median band. *Stamens* two, inserted at the base of the corolla-tube, filaments very short; anthers approximate but free, cells divaricate and superposed. *Ovary* free, pubescent, oblong, two-celled; style short, stigma bilamellate; ovules very many, on two parietal placentas. *Capsule* oblong, included, loculicidally two-valved, the valves thin, bifid. *Seeds* very numerous and minute, oblong.—*J. D. H.*

Fig. 1, Section of calyx; 2, ditto of corolla; 3, stamens; 4, transverse section of ovary:—*all enlarged.*





M.S. del. J.N. Fitch Lith.

Vincent Brooks, Day & Son Lith.

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Tab. 7118.

CARLUDOVICA Caput Medusæ.

Native country doubtful.

Nat. Ord. Cyclanthaceæ.—Tribe Carludoviceæ.

Genus Carludovica, *Ruiz & Pav.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 953.)

Carludovica *Caput Medusæ;* acaulis, foliorum lamina 3–4 pedali petiolo æquilonga cuneato-flabelliformi creberrime plicata ad medium bisecta, segmentis 3–5-fidis apices versus multifidis, laciniis ultimis pollicaribus inæquilongis recurvis acutis, nervo composito basilari intramarginale, petiolo dorso rotundato, facie planiusculo medio anguste canaliculato, lateribus rotundatis, basi in vaginam brevem dilatato, spadice breviter pedunculato majusculo globoso staminodiis inclusis 3 poll. diam. vaginato, spathis inferioribus 5–6-pollicaribus cymbiformi-lanceolatis superioribus brevioribus oblongis spadicem æquantibus; fl. masc. stipitatis, perianthii cupularis foliolis numerosis oblongis obtusis sub 2-seriatim imbricatis, staminibus perplurimis, filamentis infra medium dilatatis dein subulatis, antheris oblongis, fl. fœm., perianthio 4-dentato, dentibus triangularibus, staminodiis pollicaribus albis, ovarii tubo brevi perianthio adnato, ovario truncato 4-lobo.

Having failed to refer this fine *Carludorica* to any described species of the genus, I sent the drawing of it to my friend Professor Drude of Dresden, the learned expositor of the Brazilian species of the genus in Martiu's Flora of Brazil. He informs me that to the best of his belief it is unknown to him, and that if not *C. schizophylla* of the Flora Brasiliensis, of which he had seen only bad specimens, it is no doubt undescribed, and should be placed near to that species. Referring to the description of *C. schizophylla*, I find that it has a turbinately cylindric lax-fld. spadix, whereas that of *C. Caput Medusæ* is globose and dense-fld.

In some respects it resembles the Peruvian *C. latifolia*, figured in this Magazine (Plate 2950, 2951) as *Ludoria latifolia*, but in that plant the petiole is very much shorter than the blade of the leaf, and the compound nerve is towards the middle of each leaf segment, whereas in *C. Caput Medusæ* it is intramarginal. In both the blade of the older leaves becomes fissured towards the base in a very irregular manner, showing a tendency to split into

many narrowly cuneate laciniæ. Unfortunately the native country of *C. Capu Medusæ* is unknown, and there is no record at Kew of its receipt. Two specimens have been in cultivation for many years under the unpublished name of *C. acaulis*, which occurs in an MS. list of the species in cultivation at Kew drawn up nearly twenty years ago.

Of the genus *Carludovica* upwards of forty species are described, all tropical American. Fourteen are now in cultivation at Kew, of which only three are figured in this work,—the present, *C. latifolia*, mentioned above, and *C. ensiformis*, Hook. f., t. 6418. No doubt many more are in cultivation in continental gardens, and indeed there is one very curious species in England, a native of the United States of Columbia, which is still a desideratum at Kew, namely *C. Drudei*, Masters in the "Gardeners' Chronicle" (1877, ii. 715, fig. 136, and 1879, ii. 278, f. 46). As it is almost impossible to name the *Carludovicæ* from descriptions alone, it is to be hoped that some of the other species may soon flower, and I hope be secured for figuring in this work.

C. Caput Medusæ flowered in the Palm House at Kew, where it was planted in the ground in December, 1887, it is believed for the first time; it forms a dark-green stemless plant, with the blade of the leaves three to four feet long, and the petiole of about the same length.—*J. D. H.*

Plate 7118, figure of whole plant greatly reduced; a young leaf reduced by two-thirds; a spadix, peduncle, and sheaths of the natural size; fig. 1, section of petiole; 2, male flower; 3 and 4, stamens; 5, fem. flower; 6, transverse section of ovary:—*all enlarged*.

M S. del. J.N.Fitch, lith

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Tab. 7119.

ROSA multiflora.

Native of Japan and China.

Nat. Ord. Rosaceæ.—Tribe Roseæ.

Genus Rosa, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 625.)

Rosa (Systileæ) *multiflora;* frutex alte scandens, surculis gracillimis elongatis, aculeis tenuibus sparsis lente curvis, ramulis foliis subtus pedunculis calycibusque tomentosis v. pubescentibus sparsim glandulosis, foliolis 5–7 ovatis ovato- v. elliptico-lanceolatis obtusis acutis v. acuminatis basi rotundatis v. cuneatis, stipulis pectinatis, floribus corymboso-paniculatis parvis albis v. roseis, sepalis fructu deciduis brevibus integris ovatis lanceolatisve setaceo-acuminatis, ovariis villosis, stylis gracilibus longe exsertis in columnam cohærentibus, fructibus longe pedicellatis parvis ellipsoideis vertice annulato, acheniis paucis obtuse angulatis laxe pilosis.

R. multiflora, *Thunb. Fl. Jap.* p. 214; *Willd. Sp. Pl.* vol. ii. p. 1077; *DC. Prodr.* vol. ii. p. 598; *Miquel Prolus. Fl. Jap.* p. 277; *Franch. & Savat. Enum. Pl. Jap.* vol. i. p. 134; *Crepin in Bull. Soc. Bot. Belg.* vol. xiii. p. 250, and vol. xviii. p. 278, 279; *Deutsche Gartenzeit.* 1886, p. 101; *Franchet in Mem. Soc. Sc. Nat. Cherb.* xxiv. 216; *Helmsl. in Journ. Linn. Soc.* vol. xxiii. p. 253.

Var. flore pleno, *Bot. Mag.* t. 1059; *Bot. Reg.* t. 425, and t. 1372 (*var.* platyphylla); *Lindl. Ros. Monogr.* t. 119; *Savi Fl. Ital.* vol. i. t. 20; *Andrews Rosar.* t. 83; *Herbier de l'Amateur*, vol. i. t. 67; *Nouveau Duhamel*, vol. vii. p. 28, t. 17, and *Redoute Ros.* t. 91, 92; *Ait. Hort. Kew Ed.* 2, vol. iii. p. 263; *Brandis For. Flor.* p. 201; *Hook. f. Fl. Brit. Ind.* vol. ii. p. 364.

R polyantha, *Sieb. & Zuccarini, Fam. Nat. Plant. Jap.* pars i. p. 20; *Carriere in Rev. Hortic.* 1876, p. 253, figs. 49–53; *Gard. Chron.* 1876, vol. ii. p. 137, fig. 32; *Girdlestone l. c.* 1887, vol. ii. p. 659, fig. 127.

R. intermedia, *Carriere in Rev. Hortic.* 1868, p. 269, 270, fig. 29, 30; *Crepin in Bull. Soc. Bot. Belg.* vol. viii. (1869) p. 344.

R. diffusa, *Roxb. Fl. Ind.* vol. iii. p. 515.

R. Thoryi, *Tratt. Ros.* p. 85 (*ex DC. Prodr.*) (*var.* platyphylla).

R. Wichuræ, *K. Koch Wochenschr.* vol. xii. (1869) p. 202.

R. florida, *Poiret Encycl. Suppl. Rosa, No.* 62.

R. Grevillei & R. Roxburghiana, *Sweet Hort. Brit. Ed.* i. 138.

R. simplex, *Hort.*

The interest which attaches to this small-flowered rose arises from the fact, that though known in cultivation throughout Europe, and in India, China, and many other countries in its double-flowered state, since the beginning

of the century, it is within the last fifteen years only that it has been seen living in its natural (single-flowered) condition. In this respect its history is that of the Lady Bank's Rose, which was introduced at about the same time also in its double state, and of which the wild state has only very recently been cultivated. Of this, too, I hope shortly to give a figure in this work.

R. multiflora is a native of Japan, Corea, and Northern China, from all which countries there are copious suites of native specimens in the Kew Herbarium from many collectors. According to M. Maries, it is found in Japan at all elevations between two thousand and seven thousand feet. In Franchet and Savat's Enumeration of Japan Plants five varieties are enumerated, respectively called *genuina*, *platyphylla*, *microphylla*, *adenophora*, and *calva*, but it is not stated whether these are indigenous or garden forms. That known as var. *platyphylla* has long been known in England, and is a most beautiful rose, with large leaves, and flowers twice the size of the ordinary *multiflora*, varying from pale rose to deep rich crimson. Lindley, who gives an excellent figure of it (Bot. Reg. t. 1372), calls it the most beautiful of all the climbing roses of our gardens, but adds that the young shoots are apt to be destroyed by frosts if not matted in winter. Under this variety he cites as a synonym *R. flava* of Donn's Hortus Cantabridgensis, Ed. iv., but as Donn states that his plant of that name is yellow, it is more probably *R. Banksiæ*.

According to the Hortus Kewensis, *R. multiflora* (the double form) was brought to Kew about 1804 by Thomas Evans, Esq., and the very appropriate name of "Bramble-flowered Rose" was given to it. That of "The Seven Sisters" is, according to Lindley, the Chinese name of the var. *platyphylla*. The single-flowered *multiflora* was first published as a cultivated plant in the "Revue Horticole" for 1876, under the name of *R. polyantha*; and the specimens were procured from a nursery, their origin being presumably unknown.

For a detailed account of the species and its synonyms and affinities, I must refer to M. Crepin's critical observations cited above, which leave nothing to be desired. Botanists cannot be too grateful to that author's admirable labours in this most difficult genus. Our figure of flower

and fruit was taken from specimens communicated by Th. Girdlestone, Esq., of Sunningdale, a very accomplished cultivator and student of Roses; the plant itself formed a magnificent object in his garden, covering an area of eighteen by thirteen feet, on a sheltered wall, clothed with snow-white fragrant flowers in June, and fruiting in July. A view of the plant is given in the "Gardeners' Chronicle" (1887, vol. ii., opposite p. 659). Mr. Nicholson informs me that it is used as a stock on which to work hybrid, perpetual, and other roses.—*J. D. H.*

Fig. 1, Vertical section through young fruit; 2, carpel; 3, seed:—*all enlarged.*

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M. S. del. J. N. Pitts Lith.

L. Reeve & Co. London.

Vincent Brooks, Day & Son Lith.

Tab. 7120.

HEMIORCHIS BURMANICA.

Native of the Eastern Himalayas and Burma.

Nat. Ord. Scitamineæ.—Tribe Zingibereæ.

Genus Hemiorchis, *Kurz;* (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 641.)

Hemiorchis *burmanica;* rhizomate crasso tuberoso, caule foliifero post anthesin producto, foliis oblongis acutis in petiolum angustatis, floribus dense spicatis, pedunculo foliis bracteiformibus imbricatis occulto, bracteis parvis caducis, calycis segmentis ovatis tubo longioribus, corollæ segmentis lateralibus oblongis centrali ovato, staminodiis lateralibus obovatis, labello orbiculari.

H. burmanica, *Kurz in Journ. Asiat. Soc. Bengal*, vol. xlii. p. 108, tab. 8.

For more than half a century *Zingibereæ* have been little cultivated in Europe, and they are so difficult to study from dried specimens that our knowledge of the sub-order is now very little advanced beyond what it was in the days of Roscoe and Roxburgh. The curious plant here figured represents a genus of which at present only a single species is known. It was first described by Kurz in 1873, but there is a specimen in the Kew Herbarium which was gathered long before this, by Mr. Thos. Lobb, when he was collecting for Messrs. Veitch. For its introduction in a living state we are indebted to Mr. Gustav Mann, who sent it to Kew from Khasia in 1889. Our drawing is made from a plant that flowered at Kew last year.

Descr. *Rootstock* cylindrical, tuberous, white, naked. *Leaves* three to six, produced on a short special stem; blade oblong, acute, membranous, plain green, very pale beneath, narrowed gradually into the channelled sheathing petiole. *Flowers* produced before the leaves in a short dense spike; peduncle hidden by the imbricated membranous bract-leaves; bracts small, deciduous. *Calyx* reddish-brown; segments ovate, longer than the campanulate tube. *Corolla-tube* shorter than the calyx; lateral segments oblong, upper ovate. Lateral *staminodia* obovate, yellowish-white, about as long as the corolla-segments; labellum orbicular,

yellowish-white, minutely spotted with red-brown, with a raised vertical keel down the face; filament short; anther-cells diverging at the top. *Ovary* pubescent; style subulate; stigma turbinate, ciliated round the apical foveole. *Capsule* globose, longitudinally ribbed, crowned by the persistent calyx. *Seeds* conical, with a small white basal arillus.—*J. G. Baker.*

Fig. 1, Flower with all but labellum and calyx cut away; 2, anther; 3, ovary and stylodia; 4, style and stigma:—*all enlarged.*

M.S. del J.N. Fitch lith

Vincent Brooks, Day & Son Imp

Tab. 7121.

TILLANDSIA (Vriesea) amethystina.

Native of South Brazil.

Nat. Ord. Bromeliaceæ.—Tribe Tillandsieæ.

Genus Tillandsia, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 669.)

Tillandsia (*Vriesea*) *amethystina*; acaulis, foliis 20–30 dense rosulatis lanceolatis tenuibus flexilibus arcuatis viridibus brunneo tinctis tenuiter lepidotis, pedunculo gracili erecto foliis leviter eminente, floribus 8–12 in spicam laxissimam erectam dispositis, bracteis ovatis flavo-viridibus calyce brevioribus, sepalis lineari-oblongis citrinis, petalis lingulatis citrinis calyce multo longioribus basi intus squamatis, genitalibus breviter exsertis.

T. amethystina, *Baker in Journ. Bot.* 1888, p. 104; *Handb. Bromel.* p. 218.

Vriesea amethystina, *E. Morren in Belg. Hort.* 1884, p. 330, t. 15, 16.

This is one of the many fine Tillandsias of the section *Vriesea* which have been discovered lately in the southern and central provinces of Brazil, and introduced into cultivation in Europe, mainly through the instrumentality of our indefatigable correspondent, Dr. Glaziou, of Rio Janeiro. The present species, from its comparatively small size, is more manageable in a conservatory than several of its neighbours, and is conspicuous by its bright yellow flowers, which last for a considerable time. Our drawing was made from a plant that flowered at Kew in Oct. 1889, which was purchased from the collection of the late Professor Edward Morren soon after his death in 1886. The leaves are very ornamental.

Descr. Acaulescent. *Leaves* twenty or thirty, densely rosulate, lanceolate from a dilated clasping base, a foot or a foot and a half long, not more than an inch broad at the middle, arcuate, flexible, obscurely lepidote, green more or less tinged with brown-purple, especially on the back. *Peduncle* slender, erect, a little longer than the leaves. *Inflorescence* a lax erect spike six or eight inches long; flowers eight to twelve, sessile, erecto-patent; bracts ovate, yellowish-green, about an inch long. *Calyx* pale yellow, an inch and a half long; sepals linear oblong. *Petals* lin-

gulate, bright lemon-yellow, an inch longer than the calyx, spreading only at the tip, furnished inside near the base with a pair of distinct scales at the insertion of the inner row of stamens. *Stamens* a little longer than the petals; filaments filiform; anthers linear. *Ovary* ampullæform; style long, erect, subulate; stigmas short, not spirally twisted.—*J. G. Baker.*

Fig. 1, Petal, seen from inside; 2, pistil; 3, apex of style with stigmas:—*all enlarged.*

gulate, bright lemon-yellow, an inch longer than the calyx, spreading only at the tip, furnished inside near the base with a pair of distinct scales at the insertion of the inner row of stamens. *Stamens* a little longer than the petals; filaments filiform; anthers linear. *Ovary* ampullæform; style long, erect, subulate; stigmas short, not spirally twisted.—*J. G. Baker.*

Fig. 1, Petal, seen from inside; 2, pistil; 3, apex of style with stigmas:—*all enlarged.*

Vincent Brooks, Day & Son Lith

Tab. 7122.

ALLAMANDA violacea.

Native of Brazil.

Nat. Ord. Apocynaceæ.—Tribe Carisseæ.

Genus Allamanda, *Linn.*; (*Benth. et Hook. f. Gen. Plant.* vol. ii. 690.)

Allamanda *violacea*; frutex erectus v. subscandens, ramis pubescenti-tomentosis, foliis 3–5-nis verticillatis sessilibus oblongis obovato-oblongisve cuspidato-acuminatis supra puberulis subtus tomentosis, nervis subtus divergentibus, floribus axillaribus et in cymas tomentosas paucifloras dispositis, calycis segmentis exterioribus oblongis interioribus lanceolatis acuminatis pubescentibus, corolla roseo-v. coerulêo-purpurea ampla.

A. violacea, *Gardn. in Field. Sert. Plant.* t. 41; *J. Mueller in Mart. Fl. Bras.* vol. vi. pars i. p. 15; *The Garden*, 1890, p. 224, t. 743.

A. Blanchetii, *A. DC. Prodr.* vol. viii. p. 319; *J. Mueller l.c.* p. 11.

Notwithstanding some differences, I am disposed to regard the plant here figured as belonging to the species named above, which is but indifferently figured in Fielding's Sertum from specimens collected by Gardner in Brazil. The calyx-segments are represented in that work as linear-lanceolate, and equal, whereas in the original specimens of Gardner in the Kew Herbarium, the outer are much larger and broader than the lanceolate interior, as indeed is usual in the genus. The leaves in Gardner's Ceara specimens are all in whorls of about five (never more), but in those from Piauhy the upper are opposite. In the Kew plant they are opposite, but whorled in young shoots. Lastly, the flowers, which are described by Gardner as of a rich violet ("not unlike *Allamanda speciosa*"), are in his specimens from Crato said to be of a beautiful purple. The *A. Blanchetii* of Alph. De Candolle from the Sierra Jacobina in the province of Bahia, appears to be a stunted form, with closely set recurved leaves one and a half inches long, and a smaller flower; the specimens of it in the Kew Herbarium from Blanchet are very indifferent. Those of Moricand from the same locality are larger and better.

It may be a question whether the name of *Blanchetii* or *violacea* should be retained for this species, both having been published in the same year, 1845. I have selected

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Gardner's, as having been given to specimens collected, described, and figured by himself. He states that the plant is called Quatra Patacas in Brazil, and that its powerfully cathartic root is extensively employed in malignant fevers.

Mr. Watson informs me that *A. violacea* was in cultivation in England thirty years ago, but was soon afterwards lost; it is the first purple-flowered species known to gardens. All those figured previously in this work are yellow. Of these *A. Schottii*, t. 4351; *A. Aubletii*, t. 4411; *A. nobilis*, t. 5764, are now regarded as forms of the old *A. cathartica*, t. 338, as was indeed suspected by the Editor of this work when figuring *A. nobilis*. *A. neriifolia*, t. 4594, on the other hand, is very distinct, in the short contracted portion of the corolla-tube, and in habit and other characters.

A. violacea flowered in a stove in the Royal Gardens in September of last year, and continued in flower all through the summer. Mr. Watson tells me that there are two varieties of it at Kew, one with flowers much duller in colour than the other. That here figured was sent by Mr. Medley Wood, Curator of the Natal Botanical Gardens, in August, 1888.—*J. D. H.*

Fig. 1, Portion of corolla-tube with stamen; 2, ovary and glands:—*both enlarged.*

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Tab. 7123.

LUEDDEMANNIA Pescatorei.

Native of New Grenada.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Lueddemannia, *Reichb. f. in Bonpland.* vol. ii. (1854) p. 281.

Lueddemannia *Pescatorei*; pseudobulbis ovoideis compressis leviter sulcatis, apice plurifoliatis, foliis pedalibus sessilibus elliptico-lanceolatis acutis, scapo robusto a basi pseudobulbi decurvo, spathis paucis brevibus appressis, racemo longissimo pendulo cylindraceo densiflore, rachi valido fusco-rubro, ovariis brevibus pubescentibus, floribus 2-poll. latis, sepalis oblongis obtusis incurvis luteis fusco-rubro-irroratis, petalis sepalis æquilongis spathulato-obovatis aureis, labelli erecti basi rubro maculato lobis lateralibus erectis oblongis obtusis terminali linguiformi basi non constricto recurvo marginibus pubescentibus, disco inter lobos laterales **cristato pubescente.**

L. Pescatorei, *Lind. & Reichb. f. l. c.*; *Walp. Ann.* vol. vi. p. 563, & *in Journ. Royal Hort. Soc.* vol. viii. (1886) p. 20; *Rolfe in Gard. Chron.* 1889, **pars ii. p. 183; *Pescatorea*, vol. i. t. 22.**

Cycnoches Pescatorei, *Lindl. in Paxt. Fl. Gard.* vol. i. (1850–1) p. 123.

Acineta glauca, *Hort. Linden.*

At the date of publication of the "Genera Plantarum" the genus *Lueddemannia* was very imperfectly known, and in the absence of flowers with pollen, Bentham reduced it to *Cycnoches*, observing that (according to Reichenbach) it differed only in the pollinia being sessile on the minute caudicle. Reichenbach himself says (in Bonplandia) that *Lueddemannia* differs from *Lacaena* (see tab. 6516 of this Magazine) in the depressed spherical two-lobed? pollinia, by which it also differs from *Cycnoches*, and he describes the genus as having the habit of *Acineta* and *Peristeria*, and as closely allied to *Cycnoches barbatum*, Lindl. (Bot. Mag. t. 4479), which is the *Polygyenis lepida*, Reichb. f. (in Bonpland. 1855, p. 218).

The above-named genera may be divided into two natural groups, those with pseudobulbs bearing on their sides leaves or sheaths to which belongs *Cycnoches*; all the rest having this organ perfectly naked and leafing at the summit only. Of these latter *Peristeria* is distinguished by its suberect scapes, globose flowers, and

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L. Pescatorei, *Lind. & Reichb. f. l. c.; Walp. Ann.* vol. vi. p. 563, & *in Journ. Royal Hort. Soc.* vol. vii. (1886) p. 20; *Rolfe in Gard. Chron.* 1889, pars ii. p. 183; ***Pescatorea*, vol. i. t. 22.**

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The above-named genera may be divided into two natural groups, those with pseudobulbs bearing on their sides leaves or sheaths to which belongs *Cycnoches;* all the rest having this organ perfectly naked and leafing at the summit only. Of these latter *Peristeria* is distinguished by its suberect scapes, globose flowers, and

mobile midlobe of the lip; *Polycycnis* by its very slender column, *Lucæna* by the midlobe of the lip constricted at the base, and *Acineta* by the very fleshy perianth, which hardly expands, and the short thick column. With regard to the pollinia, their structure is essentially the same in all (except that in some species of *Peristeria* there is no strap), for that of *Lueddemannia*, as may be seen from the figure here given, is not, as Reichenbach describes it, globose and sessile on the gland, but pyriform, with a distinct strap and rather large gland. It is, however, very possible, considering the tendency to bisexuality of the allied genus *Catasetum*, that two forms of pollen may occur in *Lueddemannia*. It is also to be noticed that the pollinia of our plant is flat and apparently imperfect.

L. Pescatorei is a native of the mountains of Ocana, a province of New Grenada, at the mouth of the Magdalena River, where it was found at elevations of six to nine thousand feet by Schlim in 1848, who sent it to Linden, and it has been subsequently collected in the same country by Roezl. Specimens with the spike upwards of three feet long, and bearing upwards of ninety flowers, are known. The specimen here figured was sent for figuring by Mr. Moore of the Glasnevin Botanical Gardens, in July, 1889, the spike being thirty-four inches long. The flower had a strong scent, rather like decaying oranges.—*J. D. H.*

Fig. 1, Lip; 2, top of ovary and column; 3, anther; 4 and 5, pollinia:—*all enlarged.*

M.S. del, J.N. Fitch, lith.

Vincent Brooks Day & Son, Imp.

Tab. 7124.

BIGNONIA rugosa.

Native of Caraccas.

Nat. Ord. Bignoniaceæ.—Tribe Bignonieæ.

Genus Bignonia, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 1033.)

Bignonia *rugosa*; frutex scandens, totus hirsutus, caulibus sulcatis, ramulis teretibus, foliis 2-foliolatis, foliolis elliptico-oblongis acuminatis, basi cordatis v. rotundatis subtus reticulatim nervosis, nervis primariis validis, petiolo in cirrhum bifidum producto, floribus solitariis v. in cymas brevissime pedunculatas paucifloras confertis breviter pedicellatis, calyce campanulato ore truncato integerrimo, corollæ primulinæ extus glaberrimæ tubo elongato subcylindraceo basi contracto et intus piloso, limbi brevis subæqualis lobis 5 patentibus 2 superioribus rotundatis 3 inferioribus late obcordatis, filamentis gracilibus glaberrimis arcuatis antheris parallelis loculis angustis divaricatis, staminodio filiformi, disco late conico glaberrimo, ovario parvo oblongo, stylo elongato gracili, stigmate parvo 2-fido, **capsula compressa.**

B ? rugosa, *Schlecht. in Linnea*, vol. xxvi. p. 656; *Walp. Ann.* vol. v. p. 522.

In the absence of fruit, *Bignonia rugosa* was described as a doubtful species of the genus, and for its generic confirmation the Royal Gardens are indebted to their excellent correspondent, Dr. Ernst of Caraccas, who transmitted seeds to Kew in 1872, together with the description of the fruit which is given above. Its nearest ally is probably a plant, a native of the Antilles, figured as *Macrodiscus rigescens* by Bureau in his beautiful Atlas of the flowers and fruit of the new genera into which he proposed to divide *Bignonia*, and of which the letter-press has most unfortunately never been published. As in *B. rugosa* the calyx is truncate, the corolla tubular with subequal lobes, the stamens and disk are the same, as are the fruit and seeds in all essentials. *Macrodiscus* is probably a well-founded genus.

B. rugosa was discovered by the collector Wagener in the province of Choco, United States of Columbia, at an elevation of four thousand feet, and is described as a climber ten feet high. In the description by Schlechtendal and in native specimens from Dr. Ernst there are stipulary leaflets at the base of the petiole.

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The Kew plant of *B. rugosa* was raised from seeds sent, as stated above, by Dr. Ernst in 1872, and which flowered in the Palm House in October, 1889.

DESCR. A climbing shrub, covered except the corolla externally with soft spreading hairs, and sparingly with shorter glandular pubescence; branches slender, terete. *Leaves* bifoliolate; petiole one to one and a half inches long, rather slender, ending in a bifid tendril, petiolules about half that length; leaflets three to four inches long, oblong, acuminate, base rounded or cordate, yellow green; beneath rugose with six to eight pairs of strong nerves and reticulate nervules. *Flowers* in small shortly peduncled axillary cymes, shortly pedicelled. *Calyx* two-thirds of an inch long, campanulate with a truncate quite entire mouth. *Corolla* primrose-coloured; tube two to two and a half inches long, subcylindric, slightly curved, constricted towards the base, glabrous except the constricted part, which is laxly hairy within; limb slightly oblique, short, five-lobed; lobes subequal, spreading, the two upper orbicular concave, the three lower broadly obcordate. *Stamens* four, included; filaments long, arched, slender, glabrous; anthers of each pair parallel, cells divaricate, narrow; staminode filiform. *Disk* broadly conical, smooth, glabrous. *Ovary* small, oblong, two-celled, many-ovuled; style very slender, stigma small, two-fid. *Capsule* compressed, apiculate, four to five inches long. *Seeds* uniseriate near the margin on each side of the septum, transversely oblong, one and a half inches broad, compressed, surrounded by a complete wing.—*J. D. H.*

Fig. 1, Calyx cut open, showing the disk and ovary style and stigma; 2, corolla laid open; 3 and 4, top of filaments and anthers; 5, vertical section of ovary and disk:—*all enlarged.*

M. & del. F.N. Fitch, Lith.

Vincent Brooks, Day & Son, Imp.

Tab. 7125.

MASDEVALLIA Carderi.

Native of New Grenada.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Masdevallia, *Ruiz & Pav.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 492.)

Masdevallia (Saccolabiatæ) *Carderi;* foliis lineari-oblanceolatis apice bidentatis, scapis pendulis unifloris, spathis 1–2 appressis parvis, bractea brevi spathacea ovario breviore, floribus carnosulis symmetricis, perianthii late campanulati lobis latissimis in tila elongata repente angustatis, petalis lineari-oblongis obtusis disco intus prope apicem carunculato, labelli subsessilis hypochilo basi gibbo lateribus rotundatis, epichilo latiore quam longo saccato integerrimo, disco hypochili 2-carinato ad apicem carunculato, columna apice denticulata.

M. Carderi, *Reichb. f. in Gard. Chron.* 1883, vol. i. p. 784, and vol. ii. p. 181, fig. 30.

Of all the genera of *Orchideæ* none is so remarkable as *Masdevallia* for diversity in inflorescence, sepals, petals, and lip. Twenty species have been figured in this Magazine, and not one of these resembles *M. Carderi* in the symmetrical pendulous campanulate flowers, which show scarcely any tendency to obliquity in the position of the ovary relatively to the scape. Nor are the colours common to the genus, the predominance of white in this being very exceptional. Dr. Reichenbach refers it to the group *Saccolabiatæ*, in which the terminal lobe of the lip is conspicuously saccate, and to the near neighbourhood of his *M. Houtteana* (Illust. Hortic. t. 2106), in which the sheaths on the scape are lanceolate and loose, the perianth much shallower and more deeply divided, and the midlobe of the lip keeled within in the middle. Mr. Rolfe has pointed out to me a nearer ally in *M. Troglodytes*, E. Morren, in which the midlobe is, as in *M. Carderi*, quite even within, and the perianth of which more resembles that of the latter, though more deeply divided and very differently coloured. It further differs in the flowers being pedicelled, the narrow hypochile, and the acuminate column.

The specimen drawn of *M. Carderi* flowered in the Royal Gardens in July, 1888; it was obtained in 1887 from Messrs. Hugh Low and Co., of Clapham.

July 1st, 1890.

Descr. *Leaves* three to five inches long, by one-half to three-fourths of an inch broad, sessile, pale green, keeled, tip bidentate; basal sheaths half an inch long, truncate. *Scapes* many, one-flowered, shorter than the leaves, slender, pendulous, green speckled with black; sheaths one or two, short, appressed, acute. *Bract* one-third of an inch long, sheathing the short ribbed ovary. *Perianth* broadly campanulate, half an inch long, three-fourths of an inch across the mouth, nearly terete, symmetrical, soft and fleshy, white without and within except a ring of carmine short irregular spots and streaks towards the base, which is yellow, and a red spot at the base of each thread of the perianth, lobes very broad and short, suddenly contracted into slender yellow tails twice as long as the tubes of the perianth and speckled with red; base within hairy. *Petals* as long as the column, linear-oblong, obtuse, caruncled on the disk towards the spur. *Lip* short, fleshy, very shortly clawed, gibbously saccate; hypochile broadly oblong with rounded sides, two keels along the disk, and a caruncled broad apex, epichile short, broader than long, saccate, smooth within, margins quite entire. *Column* with a toothed apex.—*J. D. H.*

Fig. 1, Base of perianth, petals, lip, and column; 2, petal; 3, lip; 4, column; 5, pollinia:—*all enlarged.*

M S del, J N Fitch lith

Vincent Brooks Day & Son

Tab. 7126.

ASARUM caudigerum.

Native of Southern China.

Nat. Ord. Aristolochiaceæ.

Genus Asarum, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 122.)

Asarum *caudigerum*; sparse pilosum, foliis binis oppositis latissime ovato- v. subhastato-cordatis subacutis subrugosis marginibus undulatis, sinu angusto v. lato, floribus breviter pedicellatis, perianthii intus extusquo pilosi carnosuli tubo globoso-campanulato, fauce aperta, lobis triangulari-ovatis in caudas tubo duplo longiores angustatis, staminibus 12, filamentis in appendices breves obtusos productis, stylis 6 in columnam ad apices fere connatis, stigmatibus brevibus recurvis.

A. caudigerum, *Hance in Journ. Bot.* vol. xix. (1881) p. 142.

The genus *Asarum*, of which up to very recent times only five representatives were described, has of late received many remarkable accessions, especially from China and Japan, raising the number of known species to upwards of a dozen. Though not so striking a plant as the *A. macranthum* figured at Plate 7022 of the volume for 1888, *A. caudigerum* is sufficiently remarkable for the caudate tips of the three perianth-lobes, recalling those of *Masdevallia Carderi*, the figure of which accompanies this in the present number of the Magazine. Its nearest allies are *A. Hookeri*, Field. & Gard. (Sert. Plant. t. 32), a North-west American species, and *A. himalaicum*, H. f. & T., of the Sikkim Himalaya. Of these two the former has tails to the perianth-lobes, but the lobes themselves are not connate, as in *A. caudigerum*, but are separate nearly to the base, and the connectives have longer subulate tips. In Herbarium specimens of *A. caudigerum* from the Hong Kong Gardens the leaves are more hastate than in those here figured, the flowers larger, of the shape of Fig. 1 of the plate, and the anthers have much longer points. Hance, on the other hand, describes the anthers of native specimens as crowned with a small globose process, the ovarium as subinferior, and the throat of the corolla as not constricted. Possibly more than one species is in-

cluded under *A. caudigerum*. The artist in making the analysis of the staminal column observed that the stamens were in three series: six inner, erect, longest; then three in an outer series also erect, but with rather shorter filaments; and lastly three outermost with reflected very short filaments. The plant was drawn during my absence, and I could not therefore verify this observation; and owing to their soft condition after maceration, I have failed to do so with flowers taken from the dried specimens. I observe, however, that the anthers are extrorse in all the stamens.

A. caudigerum was first described by Dr. Hance, who procured specimens of it from the East River, in the Canton province of China. Specimens from the North River, in the same province, are cultivated by Mr. Ford in the Hong Kong Botanic Gardens, from whence that was procured from which the figure here given was made. It flowered in a cool green-house of the Royal Gardens in January of the present year.

Descr. Stemless, loosely clothed with long flexuous hairs; crown with a pair of opposite oblong obtuse cataphylls about an inch long. *Leaves* two, radical, two to three inches long, very broadly ovate-cordate with a deep narrow sinus, or subhastate, margins undulate, rather light green above, pale yellow green beneath, hairy on both surfaces; petiole two to three inches long. *Peduncle* much shorter than the petiole. *Ovary* broadly obovate, green. *Perianth-tube* subglobose, dirty green speckled with red-brown, villous within; lobes triangular-ovate, narrowed into slender tails an inch or more long, outer surface green, inner paler green or nearly white speckled with red. *Stamens* twelve, nine with stout erect filaments, alternately longer and shorter, and three much smaller with sharply reflexed filaments and extrorse anthers; connectives produced beyond the oblong adnate cells into a short blunt apex. *Styles* six, connate almost to their tips, forming a cone with six short free recurved obtuse stigmata.—*J. D. H.*

Fig. 1, Flower with part of the perianth cut away; 2, hair from the interior of the perianth; 3, outer reflexed, and 4, inner erect stamen; 5, column of styles and stigmata:—*all enlarged*.

Vincent Brooks Day & Son lith.

L. Reeve & Co, London.

Tab. 7127.

HAKEA laurina.

Native of South-western Australia.

Nat. Ord. Proteaceæ.—Tribe Grevilleeæ.

Genus Hakea, *Schrad.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 181.)

Hakea (Conogynoides) *laurina*; frutex v. arbor parva, glabra v. puberula, ramulis gracilibus castaneis, foliis angusto elliptico-oblongis v. oblanceolatis obtusis v. apiculatis in petiolum angustatis triplinerviis, marginibus incrassatis luride viridibus, floribus in capitulis axillaribus sessilibus globosis compactis sanguineis, stylis flavis, capitulis, immaturis squamis involucrantibusque deciduis rotundatis sericeis tectis, rachi tomentoso, pedicellis brevissimis floribusque glaberrimis, perianthii brevis lobis linearibus obtusis, toro obliquo, glandula magna, fructa subgloboso lignoso obtuse rostrato, seminibus late alatis, ala completa.

H. laurina, *Br. Prot. Nov.* 29; *Meissn. in DC. Prodr.* vol. xiv. p. 411; *Benth. Fl. Austral.* vol. v. p. 518; *E. Taufani in Bull. Soc. Tosc. Orticult.* 1888, 168, t. 8; *Gard. Chron.* 1885, vol. i. p. 148, f. 30.

H. eucalyptoides, *Meissn. in Plant. Preiss.* vol. i. p. 573; vol. ii. p. 262, and in *DC. Prodr. l. c.* p. 413; *F. Muell. Fragment.* vol. iv. p. 130.

A very striking shrub, from the abundant scarlet balls of flowers emitting long golden styles that deck the branchlets. Unfortunately it is not one that will stand in the open air in any but the warmest parts of the British Islands, and being a native of a very dry part of Australia, even the warmer counties would probably prove too damp for it. This, however, remains to be seen, for hitherto it has been treated in England only as a greenhouse plant. In the Mediterranean regions it does well; it has flowered profusely in Italy and Sicily, first, I believe, in Palermo in 1880, and later with the Baron Ricasoli, at his residence of Casa Bianca, near Argentaria, in Sardinia. Mr. Watson informs me that under the name of the Sea Urchin, it is the glory of the Gardens of the Riviera, where in Mr. Hanbury's Garden, Mortalo, near Mentone, he saw a plant of it, forming a shrub ten feet high, covered with balls of flowers, two and a half inches in diameter. The specimen here figured was flowered by M. Braves at Nice, by whom a flowering branch was sent to the Royal Gardens in 1889. It is a native of the south-west coast of

Australia, where it ranges on hills from Cape Arid to King George's Sound.

Descr. A large shrub or small tree; branches slender, red-brown. *Leaves* four to six inches long, coriaceous, narrowly elliptic-oblong or oblanceolate, obtuse or apiculate, narrowed into a petiole one to four inches long, triple-nerved and with thickened margins, dull green, sometimes minutely pubescent. *Flowers* densely compacted in axillary globose sessile heads one to two and a half inches in diameter, blood-red with long golden exserted styles one-half to three-fourths of an inch long, rachis of head densely villous; pedicels very short, glabrous; perianth a quarter of an inch long, divided nearly to the base into four linear glabrous segments with oblong reflexed antheriferous tips. *Disk* very oblique, with a large globose gland on one side. *Anthers* sessile, linear. *Ovary* oblique, narrowed into the stout decurved style, which is terminated by a bifid stigma. *Capsule* the size of a very large nut, thickly woody, subglobose, obliquely bluntly beaked; lips of the valves very broad, slightly rugose externally, very smooth internally. *Seeds* about three-fourths of an inch long; nucleus small, surrounded with a broad ovate membranous wing.—*J. D. H.*

Fig. 1, Flower; 2, the same with the style cut off; 3, reflexed portion of a segment with the anther; 4, apex of pedicel, ovary, disk and gland; 5, fruit, and 6, seed from Herbarium specimens:—*all but figs. 5 and 6 much enlarged.*

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Tab. 7128.

TRACHYCARPUS KHASYANUS.

Native of Eastern Bengal and Burma.

Nat. Ord. Palmeæ.—Tribe Coryphеæ.

Genus Trachycarpus, *H. Wendl.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 929.)

Trachycarpus *khasyanus;* caudice 30 pedali gracili lævi obscure annulato, foliis orbicularibus ambitu breviter multifidis lobis bifidis rectis v. recurvis subtus subglaucescentibus, vaginis in fibras rigidas erectas solutis junioribus marginibus furfuraceo-lanatis, petiolo limbo subæquilongo marginibus eroso-denticulatis, ligula brevi truncata, spadice bipedali nutante compressa basi spathis inclusa ramosa, pedunculo ramisque crassis 4–6-pollicaribus, spathis coriaceis flavo-fuscis marginibus apices versus villosis inferioribus bifidis rameis integris, floribus flavis ramulis spadicis tertialibus glabris confertis parvulis, sepalis ovato-oblongis obtusis quam sepala late ovata obtusa multoties minoribus, filamentis glabris petalis æquilongis, carpellis 3 demum lanatis, drupis 1–3 oblongis cæruleis.

Trachycarpus khasyanus, *Wendl. in Bull. Bot. Soc. Franc.* vol. viii. p. 429.

Chamærops khasyana, *Griff. in Calc. Journ. Nat. Hist.* vol. v. p. 341; *Palms of British India*, p. 134, t. 227 A, B; *Brand. For. Flor.* p. 546 (*syn. C. Martiana*); *Gamble Man. Ind. Timb.* 418; *Kurz For. Flor.* vol. ii. p. 526; *Verlot in Rev. Hortic.* 1876, p. 275 (*cum Ic. xylog.*).

C. Griffithii, *Lodd. Cat. Palm.* 1841.

This handsome Palm here figured is one of a pair purchased for the Royal Gardens, Kew, at the sale of the collections that ornamented the Conservatory of the Royal Horticultural Gardens, South Kensington, in 1889. They are supposed to have been originally procured from the garden of the Duke of Wellington at Strathfieldsaye, and they are now in the Temperate House of Kew, planted in the ground. It is an interesting Palm, as connecting botanically and in geographical range the Himalayan with the Chinese and Japanese species of the genus, namely, *T. Martianus*, Wendl., of the Western Himalaya, the Chinese *T. Fortunei*, Hook. Bot. Mag. t. 5221 (*Chamærops*), and the cultivated *T. excelsus*, Wendl., of Japan. These species are closely allied, insomuch that Griffith, Verlot, Gamble, Brandis and others have hazarded the opinion that two or all of them may be forms of one. As

grown at Kew, however, they show, as in distribution, considerable differences. *T. Martianus* is confined to the Western Himalaya, extending in so far as is known from Central Nepal to Kumaon, where it ascends to seven thousand eight hundred feet elevation. It has leaves very glaucous beneath with drooping tips to the segments, and the drupe is described as yellow, but Brandis and others say that this is its colour in the unripe state only, for when ripe it is pale blue. The fibrous remains of the leaf-sheaths form a beautiful close network. *T. khasyanus* extends from the Western Khasia hills, at three thousand five hundred to four thousand feet elevation, into Munnipore (top of Mount Kassoma, altitude six thousand five hundred feet, *Watt*), and thence into Burma (pine forests of Martaban, altitude four thousand to six thousand five hundred feet, and the Kakhyen hills in Ava, *Kurz*); it also occurs in Upper Burma, at Monyen, altitude five thousand to six thousand feet, *J. Anderson*, there bordering on China. The leaves are hardly glaucous beneath, the young densely furfuraceous along the edges of the folds, their tips straight (in a sketch of my own made in the Khasia) or recurved (*Griffith*), not drooping, and the drupe is a dirty blue. It has not been found in the Eastern Himalaya, except small plants of what Mr. Gamble thinks may be the same should prove to be so, and which that botanist found near Dumsong in Sikkim, altitude six thousand five hundred feet.

Whether *T. khasyanus* differs or not specifically from *T. Martianus* is doubtful. Griffith distinguishes *khasyanus* by its shorter stouter stature, the petioles toothed throughout, the nature of the rete, and the texture of the leaves, which is more like that of *Chamærops humilis*,—not one of which characters do I find to be valid, except perhaps the rete. Both, however, unquestionably differ from *T. Fortunei* and *excelsa* in their beautiful slender polished trunks, with a very short crown of appressed fibrous sheaths at the top; whereas in the Chinese plants the much stouter trunk is clothed for upwards of seven feet with a dense ragged mass of sheath-fibres. The leaves of the Indian plants are on the whole less deeply lobed, though much more deeply than is represented by the artist in the reduced figure of the plant here given.

Under Plate 5221 such differences as were then observed between *T. Fortunei* and *excelsus* are clearly given. An examination of numerous specimens in the Temperate House at Kew and in the open air of the *Fortunei* shows these to be fallacious, though the extreme forms, of leaves with straight and with drooping tips, are discernible. A more remarkable character of *Fortunei* is the great length of the petiole of some specimens; this organ, which is rarely much longer than the diameter of the blade, is in some specimens, growing both in and out of doors, twice or even thrice that length. Its greater length is attributed at Kew to the plant having been grown indoors.—*J. D. H.*

Fig. 1, Base of lamina of leaf and ligule; 2, back, and 3, front view of flower; 4 and 5, stamens; 6, carpels; 7, the same dehiscing when still young; 8, transverse section of the same, showing the ovule; 9, drupe dried (from the Kew Museum); 10 and 11, ventral and dorsal view of the same:—*all but figs.* 1 *and* 9 *enlarged.*

M.S. del, J.N. Fitch, lith.

Vincent Brooks Day & Son Imp.

Tab. 7129.

PLEUROTHALLIS platyrachis.

Native of Costa Rica.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Pleurothallis, *Br.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 488.)

Pleurothallis *platyrachis*; cæspitosa, foliis 4–6 pollicaribus in petiolum angustatis oblanceolatis carinatis apicibus obtusis integris 3-denticulatisve, scapis gracilibus foliis longioribus anguste bialatis apice 4–6-floris, bracteis subdistichis ovatis acutis viridibus infimis vacuis, floribus suberectis breviter et crasse pedicellatis, ovario brevi 3-gono, perianthio pollicari flavo punctulato, sepalis carinatis marginibus recurvis ovato-lanceolatis acuminatis supra medium verruculosis nervis viridibus, petalis minutis lineari-oblongis obtusis brunneis, labello basi rotundato dein recurvo anguste lanceolato acuminato superne bicarinato carinis rubris, **columna supra medium alata, basi antice tumida.**

P. platyrachis, *Rolfe in Journ. Bot.* 1890, p. 136 *in note.*

Masdevallia platyrachis, *Rolfe in Gard. Chron.* 1888, pt. ii. p. 178.

This is one of the largest and largest-flowered of the many species of the section of *Pleurothallis* to which it belongs; and it approaches so closely in habit to *Masdevallia*, that it was at first referred to that genus, from which the sepals free to the base distinguish it. It belongs to the stemless tufted section of the genus as defined by Lindley in his monograph of *Pleurothallis*, published in his "Folia Orchidacea," but is not very near to any hitherto described species. According to Bentham's classification of the species in Genera Plantarum, it falls under his first section of "Elongatæ Floribundæ." No fewer than three hundred and fifty of its congeners are described by Lindley, of which very few were ever in cultivation, though many are remarkable for the singularity (see *P. insignis*, pl. 6936), and some for the gem-like beauty and curious structure of their small flowers (see *P. Reymondi*, pl. 5385).

P. platyrachis was obtained at Kew, from Messrs. Shuttleworth, Carder and Co., of Clapham, in 1884, and flowered in October of last year.

Descr. *Stems* tufted. *Leaves* five to six inches by about

one inch at the broadest part, elliptic-oblanceolate, obtuse, notched with a terminal apiculus, keeled beneath, pale green, contracted below into a channelled petiole; basal sheath short, funnel-shaped, mouth oblique, brown. *Scape* radical, stout, longer than the leaf, with three to five short acute sheaths, two-edged or narrowly two-winged upwards, green speckled, sometimes densely, with brown; raceme one to one and a half inch, inclined, six- to ten-fld.; rachis stout, bracts one-third of an inch long, ovate, acuminate, coriaceous, green, persistent; obconic ribbed ovary with the short stout pedicel one-third of an inch long; perianth gaping, puberulous. *Sepals* two-thirds of an inch long, golden yellow, punctulate, strongly keeled, dorsal lanceolate from an ovate concave base; lateral narrower, linear-lanceolate. *Petals* very small, shorter than the column, linear-oblong, obtuse, caruncled or crenulate along the outer edge, yellow. *Lip* with a long stout incurved claw; limb not half as long as the sepals, lanceolate, acute, recurved, yellow, with a deep central canal bounded by an elevated ochreous ridge on each side. *Column* incurved, obtuse, broadly winged from below the middle to the top, and with a large callus on the base in front; anther hemispheric; pollinia two, pyriform.—*J. D. H.*

Fig. 1, Portion of winged scape; 2, flower with sepals removed; 3, column; 4, lip; 5, anther; 6, pollinia :— *all enlarged.*

M S. del, J.N. Fitch, lith.

Vincent Brooks Day & Son, Imp.

Tab. 7130.

ACONITUM Fischeri.

Native of North-East Asia and Japan, and N. America.

Nat. Ord. Ranunculaceæ.—Tribe Helleboreæ.

Genus Aconitum, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 9.)

Aconitum *Fischeri*; erectum, robustum, glabrum v. superne glanduloso-pubescens, foliis caulinis petiolatis 3-partitis, segmentis cuneatis trifidis inciso-lobatis, racemo stricto erecto multifloro, bracteis inferioribus foliaceis 3-fidis, superioribus parvis oblongis integerrimis, pedicellis erectis medio 2-bracteolatis, floribus magnis puberulis pallide cœruleis, sepalis anticis oblique oblongis v. lineari-oblongis obtusis, lateralibus orbiculatis pilosis, postico in galeam altiorem quam latam compressam rostratam producto, filamentis glabris late alatis, petalis superioribus ungue elato, calcare antice dilatato dentato postice revoluto, folliculis erectis pubescentibus reticulatim nervosis.

A. Fischeri, *Reichb. Monogr. Gen. Aconit.* t. xxii.; *Franchet in Mem. Soc. Nat. Cherb.* vol. xxiv. p. 198 (*excl. syn. Dene.*); *Franch. & Savat. Enum. Plant. Jap.* vol. i. p. 12; *Hemsl. in Journ. Linn. Soc.* vol. xxiii. p. 20; *Brewer & Wats. Bot. Calif.* vol. i. p. 12.

A. sinense, *Sieb. & Zucc. Fam. Nat. Pl. Jap.* No. 335 (*non* A. chinense, *Bot. Mag.* t. 3852).

A. autumnale, *Lindl. in Journ. Hort. Soc.* vol. ii. p. 77, and in *Paxt. Fl. Gard.* vol. i. p. 187 *with fig.*

A. arcuatum, *Maxim. Fl. Amur.* p. 27.

A. Carmichaelii, *Debeaux Fl. Tientsin, Addend.* p. 61.

A. nasutum, *Fisch. mss. ex Sprengel Syst. Veg.* vol. ii. p. 621, *excl. syn.*; *Hook. Flor. Bor. Am.* vol. i. p. 26; *Torr. & Gr. Flor. N. Amer.* vol. iv. p. 31; *Walp. Rep.* vol. i. p. 58.

A. Labarskyi, *Reichb. l. c.* t. 20 (*fid. Regel*).

A. maximum, *DC. Syst.* vol. i. p. 380; *Prodr.* vol. i. p. 61 (*non Pall. Herb., nec Reichb., ex Regel*).

A. columbianum, *Nutt. ex Torr. & Gr. Flor. N. Am. l. c.*; *Coulter Man. Bot. Rocky Mts. Reg.* p. 11.

A. noveboracense, *A. Gr. Bot. N. U. States*, Ed. vi. p. 47.

A. napellus, *Thunb. Fl. Jap.* p. 251 (*non Linn.*).

Aconitum sp., *Hemsl. in Journ Bot.* vol. xiv. (1876), p. 206.

The reduction of the species and varieties of *Aconitum* to system is a task awaiting the labour, and it will be no slight one, of a very judicious botanist. Upwards of three hundred specific names have been advanced for probably not more than thirty species. A great number of these have already been reduced to synonyms, and as many more remain to be relegated to the same category. The genus is a very widely distributed one, from the Atlantic to the Pacific, which it crosses to N. America, where one species is found common to both the Eastern and Western States. In latitude it ranges from the Arctic

regions to the Mediterranean in Europe; to Asia Minor and the Himalaya in Asia; and to New Mexico in the Western States of America, and Carolina in the Eastern. Of all the species none occupies a wider geographical area than *A. Fischeri*, namely in Eastern Asia from Kamtschatka to the Yang-tse-kiang in China, in Corea and Japan, and in N. America from Alaska and British Columbia to New Mexico, and if American botanists are correct, to the Eastern States. I have collected it in company with Dr. Gray in Southern Colorado on the border of the latter country, on the La Veta Pass at ten thousand feet elevation, and further north in both the Rocky Mountains and Sierra Nevada.

It needs hardly be said that with this wide distribution *A. Fischeri* varies much, and I am far from supposing that the long list of synonyms collected above with considerable labour is inexhaustive; for it appears to me probable that certain allies, some scandent and some more tomentose, may have to be specifically incorporated with it, as *A. volubile*, Pall., *A. villosum*, Reichb., and *A. noreboracense*, A. Gray, Manual, Ed. vi., p. 47; and all may go into *A. uncinatum*, Linn. Into this extended inquiry I am not prepared to go without an exhaustive examination of specimens that would take much time and labour. I can only state here that the principal distinctive character adduced for *uncinatum* by De Candolle is the evanescent wings of the filaments, which, however, are well developed in A. Gray's figure (in Gen. N. Am. Plants). The segments of its leaves are broader than in the Western American plant, and in the common forms of the Asiatic, but in some specimens of the latter there is no difference in this respect.

The *A. chinense*, Sieb. (Tab. 3852 of this work), is at once distinguished by its semicircular hood; but I do not see how the N. American *A. uncinatum*, Linn., of this Magazine, Plate 1119 (and which is, I suppose, A. Gray's *A. noreboracense*), is to be specifically distinguished.

The specimen here figured was received at the Royal Gardens from Mr. Max Leichtlin, in 1886, under the name of *A. californicum*, and the drawing was made in October of last year.—*J. D. H.*

Fig. 1, Apex of pedicel, with petals and stamens, *enlarged*; 2, young fruit of the *natural size*.

A.S. del, J.N. Fitch, Lith.

Tab. 7131.

EPISCIA maculata.

Native of British Guiana.

Nat. Ord. Gesneraceæ.—Tribe Cyrtandreæ.

Genus Episcia, *Mart.*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 1006.)

Episcia *maculata*; robusta, scandens, pilosula, ramis pendulis radicantibusque, foliis petiolatis ovatis oblongo-ovatisve acuminatis integerrimis serrulatisve basi rotundatis cordatis v. acutis, supra nitidis nervis impressis, subtus pallidis, floribus in cymas axillares crasse pedunculatas foliaceo-bracteatas dispositis breviter pedicellatis, calycis obliqui segmentis 4 lineari-oblongis subacutis pilosis quinto multo minore, corolla 1½-pollicari flava sanguineo creberrime maculata glaberrima, tubo infra medium cylindraceo in calcar uncinatum obtusum producto superne subcampanulato, limbi lobis subæqualibus 4 rotundatis patulis quinto carnosulo concavo inflexo orem corollæ claudente, filamentis ovarioque glaberrimis.

A very beautiful plant, both in foliage and flower, for it is difficult to conceive anything more lustrous than the polished leaves, which reflect the light from every inequality of their surface. According to notes accompanying native specimens collected by Mr. Im Thurn, and by Mr. Jenman, on the Pomeroon River in British Guiana, it is a climber, and no doubt the leafy branches are pendulous, for as grown at Kew it flourishes in a wire basket, the branches hanging down on all sides, clothed with brilliantly green leaves. I can find no description of this plant, nor do I find the curious character of the fifth lobe of the corolla being inflexed and covering the throat like a trap-door, noticed under the genus, or under any of the species. Amongst the native specimens in the Herbarium some have leaves twice as large as those here figured, and purplish red underneath; their petioles vary greatly in length, as do the lobes of the calyx. The branches of the cyme are sometimes lengthened, and the flowers secund.

E. maculata flowered for the first time at Kew in September of last year, and it will be again in flower at the end of this month.

August 1st, 1890.

Descr. *Stem* as thick as a swan's quill, scandent by fibrous roots on trunks of trees; branches six to eighteen inches long, pendulous, nearly as thick as the little finger, succulent, pale green, sparsely hairy, as are the petioles, leaves and calyx. *Leaves* three to six inches long, more or less recurved, ovate or oblong-ovate acuminate, entire or serrate, bright shining green above with impressed nerves, paler beneath, base acute rounded or cordate; petiole stout, one to three inches long. *Flowers* in stoutly peduncled axillary rather dense branching cymes, with leafy bracts. *Calyx* one inch long, oblique, five-partite, four lobes linear-oblong suberect, the fifth much smaller, spreading. *Corolla* two inches long, yellow spotted with bright red, tube subcampanulate above, narrow below and produced beyond the calyx into a stout curved obtuse horn; lobes five, rounded, four of them spreading, the fifth rather thicker and inflexed over the throat of the tube; stamens inserted about the middle of the corolla-tube, included, filaments free, glabrous; anthers oblong, cohering in pairs by their tips, cells parallel; disk a large dorsal gland. *Ovary* glabrous; style elongate, stigma subcapitate.—*J. D. H.*

Fig. 1, Calyx and ovary; 2, section of part of corolla showing the stamens; 3, fifth (inflected) lobe of the corolla; 4, ovary and disk gland:—*all enlarged.*

J.S. del, J.N. Fitch. lith.

Vincent Brooks Day & Son Imp.

Tab. 7132.

PEDICULARIS megalantha.

Native of the Eastern Himalaya.

Nat. Ord. Scrophularineæ.—Tribe Euphrasieæ.

Genus Pedicularis, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 978.)

Pedicularis *megalantha*; erecta, elata, puberula v. villosula, foliis alternis petiolatis ovato- v. lineari-oblongis caulinis pinnatifidis lobis crenulatis, calycis tubo cylindraceo v. subinflato nervoso, lobis 5 subæqualibus v. inæqualibus rotundatis cristato-crenatis, corollæ roseæ v. purpureæ tubo gracillimo calyce 2–4-plo longiore, limbi labio superiore annulari in cornu elongatum incurvum producto, inferiore latissimo concavo 3-lobo, lobo medio angusto, filamentis sparse pilosis.

P. megalantha, *Don Prodr.* 94; *Wall. Cat.* 411/1; *Benth. in DC. Prodr.* vol. x. p. 564; *Hook. f. Fl. Brit. Ind.* vol. iv. p. 312; *Maximow. in Mel. Biol.* x. p. 82, et xii. p. 793; *Prain in Journ. As. Soc. Beng.* vol. lviii. p. 269.

This noble *Pedicularis* is one of the ornaments of the subalpine regions of the Eastern Himalaya, where I found it rearing its head above long grass in Sikkim in 1849, at eleven thousand to thirteen thousand feet above the sea. It was discovered by Wallich in Central Nepal in 1820, and specimens sent to the late Mr. Lambert were described by Don in the "Flora Nepalensis" in 1825. It was distributed by Wallich under the above name, and is one of two plants or varieties included under No. 411 of his Catalogue. Of these No. 411/1 is a Nepal plant with rosy flowers, identical with this; the other, Wallich's No. 411/2, is a yellow-flowered species hitherto supposed to be a variety, and published as *P. megalantha* in the "Flore des Serres" (t. 943). It has a different distribution, namely from Kumaon westward to Kashmir, at considerably lower elevations than *P. megalantha* affects (seven thousand to twelve thousand feet), and has not hitherto been found in the Eastern Himalaya. It has a shorter corolla-tube, and there are differences in the form of the corolla-lobes, but it is difficult to detect these in specimens that have been dried. It may be the *P. Hoffmeisteri* of Klotzsch, figured in the Botany of the Voyage of Prince Waldemar in the

Himalaya. No locality for this is given, nor is the colour of its flower; and as Dr. Hoffmeister, its collector, travelled both in Central Nepal and in the Western Himalaya, it is most probably from the latter country, where the yellow-flowered plant is a far more common one than is the rosy-flowered one in the Eastern. I may here mention that in the "Flora of British India," in the absence of specimens of it, *P. Hoffmeisteri* is referred as a synonym to the closely allied *P. siphonantha*, an error which Dr. Prain, the Herbarium-keeper of the Royal Gardens, Calcutta, and author of a valuable revision of the Indian species of the genus, has had the means of correcting, by a comparison of authentic materials. He refers it as a synonym to *P. megalantha*, but whether to the rose-coloured or yellow-flowered plant of that name does not appear; from the shortness of the corolla-tube as figured, I should judge it to belong to the latter, in which case, and if it prove specifically distinct from *megalantha*, the name of *Hoffmeisteri* should be retained for the western species.

The species of *Pedicularis* are amongst the most abundant and beautiful of the herbaceous plants of the Himalaya, in many respects not yielding to *Primula* itself; some of the species attain a height of two to three feet, bearing long racemes of purple flowers; others, from higher elevations, are dwarfs, the long tubes of their flowers rising amongst the tufted leaves. In the "Flora of British India" I have described thirty-seven species, the number known up to that time. Since then collectors sent by Dr. King, especially to the Tibetan provinces of Sikkim, only lately accessible to British subjects, and other collectors in Burma, have enabled Dr. Prain nearly to double that number of Indian species. This extension eastwards of the genus indicates the accession of a prodigious number of new species from the mountain ranges between Sikkim and Western China.

P. megalantha was received for figuring from G. Wilson, Esq., F.R.S., and is one of the many valuable acquisitions to horticulture due to the energy and skill of that eminent cultivator.—*J. D. H.*

Fig. 1, Calyx; 2, lip of tube of corolla with upper lobe; 3, stamens:—*all enlarged.*

L. Reeve & Cº Londo:

Vincent Brooks Day & Son Imp.

Tab. 7133.

CATTLEYA Lawrenceana.

Native of British Guiana.

Nat. Ord. Orchideæ.—Tribe Epidendreæ.

Genus Cattleya, *Lindl.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 53).

Cattleya *Lawrenceana*; rhizomate valido, pseudobulbis validis clavatis v. elongato-fusiformibus 8–10-sulcatis monophyllis, folio 6–8 pollicari lineari-oblongo obtuso rigido basi vaginis membranaceis vestito, scapo brevi valido vaginato plurifloro, floribus amplis 4–6 poll. latis sæpius læte roseis, limbo labelli sanguineo-purpureo, sepalis anguste lineari-oblongis obtusis recurvis marginibus undulatis, petalis magnis late oblongis marginibus undulatis lobulatis cristatisve, labelli tubo elongato subcurvo anguste cylindraceo, limbo explanato orbiculari bifido marginibus revolutis denticulatis, columna breviuscula.

C. Lawrenceana, *Reichb. f. in Gard. Chron.* 1885, vol. i. p. 338 and 374, figs. 68, 69; *Reichenbachia*, vol. i. t. 12; *Lindenia*, vol. i. t. 44; *Warner Orchid. Alb.* t. 342; *Im Thurn in Trans. Linn. Soc. Ser.* 2, vol. ii. p. 249; *Ridley l. c.* p. 282; *Veitch Man. Orchid.* pars ii. p. 40.

C. pumila, *Schomb. Reise in Brit. Guian.* vol. iii. p. 1068 (*non Hook. Bot. Mag.* t. 3656).

A reference to the plate of *Cattleya Skinneri* (t. 4270) in this Magazine shows a remarkably close resemblance between that plant and this, so close, indeed, that it would not be easy to distinguish them by words for botanical purposes, except that the pseudobulbs of *Lawrenceana* are monophyllous. *C. Skinneri* is a native of Guatemala, and assuming the above-cited figure to represent the plant in a normal state, its flowers differ from those of *Lawrenceana* in being smaller with much shorter and broader sepals and petals, and a much shorter tube of the lip, the limb of which is less crenulate, and by the throat of the latter being bright yellow. The colour of the whole flower of *C. Skinneri* is more dingy, and though called in the description "brilliant rosy" in one place, in another it is described (more in accordance with the plate) as "of the most lovely lilac-purple tint imaginable." On the other hand, *C. Lawrenceana* is described by Warner as having rosy-purple flowers, with a dark purple band in front of the white throat of the lip; but I do not find the latter character in any published drawing of

this species. Referring to the excellent descriptions of both in Veitch's Manual (Pt. ii.), the chief difference lies in the number of leaves, for their flowers appear to be of the same dimensions, and in both to vary to white.

The discoverers of this splendid Orchid were the brothers Schomburgk, who found it at the base of Roraima, when employed by the British Government in surveying the boundaries of British Guiana with Brazil and Venezuela. Sir Robert Schomburgk, however, assumed it to be *C. pumila*, Hook., which is a Brazilian *Lælia*, erroneously supposed to be Demararan (not *C. Mossiæ*, as stated in Veitch's Manual and other works), as determined by Mr. Ridley from an examination of Schomburgk's drawings preserved in the British Museum. It was next met with in the same locality by Mr. Siedel, when collecting for Messrs. Sanders and Co., and shortly afterwards by Mr. Im Thurn during his remarkable journey and ascent to the supposed inaccessible summit of Roraima.

The following is Mr. Im Thurn's account of the habitat of *C. Lawrenceana*, and of the vegetation of Roraima, published in the Linnean Society's Transactions cited above :—

"It was here, too (at the base of Roraima), in the deep cuttings made by the river (Kookenaam), and half filled up with huge blocks of stone, that are now overgrown with large trees and shrubs, that one of the most famous of all Roraima plants grows—*Cattleya Lawrenceana*."

"This Cattleya is doubtless the one collected by the Schomburgk brothers, and enumerated by Richard Schomburgk as *C. pumila;* for it appears to be the only representative of this genus occurring on this side, at least of Roraima, and this was the only side visited by the Schomburgks. It grows apparently not high up upon the mountain, but on the gnarled tree-trunks close to the water, in the clefts through which the Kookenaam and some of its small tributary streams flow, at the height of about three thousand seven hundred to four thousand feet above the sea. At the time of our visit Mr. Siedel, an orchid-collector, having set the natives to work to collect the plant for him, I have seen ten or twelve of these people come into camp, afternoon after afternoon, each laden with a basket (a good load for a man) full of these lovely plants, many of them in full flower. One day I

myself, having gone down to the Kookenaam to bathe, gathered, just round the small pool I chose for the purpose, two most glorious clumps of this Orchid, the better of the two having five spikes of flowers, of which one bore nine, each of the others eight blossoms—in all forty-one of some of the largest and finest Cattleya flowers ever seen on a single small plant, the roots of which easily lay on my extended hand."

The plant here figured flowered in the Royal Gardens in March of the present year.—*J. D. H.*

Fig. 1, Column and anther; 2, anther; 3, pollinia:—*all enlarged.*

M.S. del, J.N. Fitch, lith

Vincent Brooks Day & Son, Imp

Tab. 7134.

CELMISIA Lindsayi.

Native of New Zealand.

Nat. Ord. Compositæ.—Tribe Asteroideæ.

Genus Celmisia, *Cassini*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 278.)

Celmisia *Lindsayi*; rhizomate repente, foliis 2–4 pollicaribus lineari-oblongis lanceolatisve obtusiusculis remote denticulatis coriaceis supra lævibus glabris subtus appresse niveo-tomentosis nervis paucis obscuris, scapo gracili puberulo, bracteis linearibus, capitulo 2 poll. diam., involucri cylindracei glabri viridis bracteis multiseriatis linearibus acuminatis appressis, ligulis ad 30 vix biseriatis linearibus albis non recurvis, disci corollis aureis tubo basi incrassato, antheris basi obtusis, acheniis teretiusculis sericeis.

C. Lindsayi, *Hook. f. Handbook of the New Zealand Flora*, p. 132; *Lindsay, Contrib. to New Zeald. Bot.* p. 53, t. 3, f. 1.

Under *C. spectabilis*, Plate 6653, I have made a few observations on the Celmisias, the great Daisies of New Zealand, and their value as cultivated plants; but numerous as they are, nearly thirty species being known, almost all attempts to raise and flower them from seed have proved unavailing; in fact, the only two that are known to me in cultivation are the present and the one above alluded to. Their near allies, the shrubby Eurybias and Olearias of the same islands, grow fairly well in the latitude of London, but not with the luxuriance which they attain in the west of England and Ireland; and as some of them inhabit the same country and even localities as some Celmisias, there is every reason to hope that many of the latter may find as congenial conditions in the rock garden as Dr. Balfour tells me that *C. spectabilis* has in the Edinburgh Botanical Gardens.

C. Lindsayi was discovered by the late Dr. Lauder Lindsay during a visit which he made to New Zealand on trap cliffs at the mouth of the Cluthe River, Shaw's Bay, in the province of Otago. It differs from the normal species in the obtuse bases of the anther-cells, in which it resembles an *Erigeron*, and invalidates the chief character by which *Celmisia* is distinguished from that

genus. In the uniseriate ray flowers with rather broad ligulæ it more resembles *Aster*, differing in the terete achene. In his notes on the Botany of the Island, Dr. Lindsay states that the soft cottony matter on the leaves of some species of *Celmisia* forms balls or concretions in the stomachs of animals that obstruct the passage of food through the intestines, and so frequently causes fatal disease.

The specimen here figured is considerably larger than the native ones collected and figured by Dr. Lindsay, in which also the ray corollas are faintly lilac. It was received at Kew in 1884 from the Edinburgh Botanical Gardens, and flowered in May of the present year in a cold pit. Mr. Lindsay informs me that Mr. Max Leichtlin sent the plant to Edinburgh some years ago, that it has not yet flowered there in the open ground, and that it requires protection in winter, but from damp rather than from cold.

Descr. *Stems* densely tufted from a stout rootstock, nearly as thick as a swan's quill, and three to six inches long, upper parts densely leafy. *Leaves* two to four inches long, lanceolate or oblong-lanceolate, obtuse, obscurely distantly denticulate, very coriaceous, smooth, dark green, glabrous and shiny above, beneath clothed with snow-white appressed tomentum; nerves beneath few, obscure, and midrib green. *Scape* five to six inches high, slender, flexuous; bracts linear, green, lower one to two inches long, with recurved margins, white beneath. *Involucre* cylindric, glabrous; bracts many-seriate, linear, acuminate, appressed. *Ray flowers* thirty to forty, spreading but not recurved; margins recurved, tips minutely three-toothed. *Disk flowers* yellow. *Stamens* with obtuse bases. *Achenes* terete, silky; pappus of few rigid unequal bristles. —*J. D. H.*

Fig. 1. Flower of ray; 2, its pappus bristles; 3, flower of disk; 4, stamens; 5, style-arms of disk flower:—*all enlarged.*

M S del. J N Fitch, lith

Vincent Brooks Day & Son Lith

Tab. 7135.

IRIS (Juno) Rosenbachiana.

Native of Central Asia.

Nat. Ord. Irideæ.—Tribe Moræeæ.

Genus Iris, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 686.)

Iris (Juno) *Rosenbachiana*; bulbo parum incrassato tunicis membranaceis, foliis 3–5 lanceolatis falcatis ad anthesin flore brevioribus marginibus haud incrassatis, caulibus brevissimis 1–3-floris, spathæ valvis lanceolatis viridibus, perianthii tubo elongato, limbo versicolori sæpissime purpureo vel lilacino, segmentis exterioribus oblongo-cuneatis infra apicem luteo carinatis ungue pulchre striato, segmentis interioribus parvis patulis oblanceolatis, styli cristis magnis oblique ovatis.

I. Rosenbachiana, *Regel Descr.* pt. ix. p. 35; *Gartenfl.* vol. xxxv. (1886), pp. 409, 617, t. 1227; *Foster in Gard. Chron.* 1887, vol. i. p. 90; 1889, vol. i. p. 530; *Garden*, tab. 653, fig. 2.

This is a new bulbous Iris, allied to *persica*, *caucasica*, *orchioides* and *palæstina*, which seems likely to be very popular. It was first found not many years ago by the Russian botanists on the mountains of Turkestan and Bokhara, at an elevation of from six thousand to nine thousand feet above sea-level, and has been widely distributed by Dr. Regel. Professor Foster says that it is quite hardy in England, and more variable in the colouring of the flower than any other species of the genus. Full details of the range of variation will be found in his two papers in the "Gardener's Chronicle," above cited. Our drawing was made partly from plants that flowered at Kew last February, and partly from material furnished by Professor Foster.

Descr. *Bulb* ovoid, little swollen, with thick root-fibres and membranous tunics. Produced *leaves* three to five, little falcate, lanceolate, short at the flowering time, finally six or eight inches long, one and a half or two inches broad; margins little thickened. *Stem* very short, bearing one to three flowers. *Spathe-valves* lanceolate, about two inches long, green at the flowering time. *Perianth-tube* generally about three inches long, sometimes half a

foot ; limb two inches long, very variable in colour ; outer segments obovate-cuneate, with a reflexing blade shorter than the ascending claw, generally dark violet-purple towards the tip, with a slaty lilac claw with a bright yellow keel and darker lilac veins ; inner segments oblanceolate, concolorous, pale lilac, about an inch long, spreading horizontally. *Style-branches* above an inch long ; crests very large, oblique ovate.—*J. G. Baker.*

Fig. 1, An anther, front view ; 2, an anther, back view ; 3, apex of style, with crests :—*all enlarged.*

M.S.del, J.N.Fitch, lith.

Vincent Brooks Day & Son, Imp.

Tab. 7136.

REINWARDTIA TETRAGYNA.

Native of the East Indies.

Nat. Ord. Lineæ.—Tribe Eulineæ.

Genus Reinwardtia, *Dumort*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 243.)

Reinwardtia *tetragyna*; foliis elliptico-lanceolatis oblanceolatisve acuminatis crenato-serratis, in petiolum brevem angustatis pallide viridibus, floribus in corymbos terminales sessiles dispositis, sepalis elliptico-lanceolatis acuminatis, petalis pallide aureis.

R. tetragyna, *Planch. in Hook. Lond. Journ. Bot.* vol. vii. p. 523; *Hook. f. Fl. Brit. Ind.* vol. i. p. 412; *Rev. Hortic.* vol. xiv. pp. 7 and 27, *cum Ic.*

Linum tetragynum, *Coleb. in Wall. Cat.* No. 1506; *Clarke in Journ. Linn. Soc.* vol. xxv. p. 9; *Collett in Proceedings of Simla Nat. Hist. Soc.* 1886 (*Clarke l. c.*).

A very common inhabitant of the same parts of India as *R. trigyna*, figured in this work as *Linum trigynum* (see Plate 1100), and so closely allied to it, that it is doubtful whether intermediates may not prove them to be varieties of one. In the form here figured it is a very different-looking plant, with longer acuminate serrated leaves of a lighter colour, and paler yellow larger flowers than those of the form of *L. trigynum* now in cultivation, though a reference to the plate of this work cited above shows that as then cultivated the flowers of *R. trigyna* were quite as large. The character upon which the two species were both founded and named, that of three and four styles, is a very fallible one, for the styles of *R. tetragyna* vary from three to five.

A more interesting point in the history of the Reinwardtias is that of their trimorphic flowers as regards the relative lengths of their stamens and styles. That these organs were di- and trimorphic in various species of *Linum* proper was first indicated by Mr. Darwin, in papers communicated to the Journal of the Linnean Society of London (vol. vi. p. 96, and vol. vii. p. 69), wherein the effects of their relative positions in respect of the fertilization by insects of the flowers and the amount of seeds produced, is worked

out with admirable skill. As regards *R. trigyna*, its trimorphism has been described by Alefeldt (in Bot. Zeitung, 1863, p. 281), and by Urban (in Brandenb. Abhandl. 1880, p. 18). There is also in the Kew Herbarium a beautiful series of specimens showing the various modifications in the length of styles and stamens, prepared by Gen. Collett, F.L.S. (now commanding in Assam), and who, in a paper read before the Natural History Society of Simla, in 1886, referring to *R. trigyna* and *tetragyna*, observes that the number of styles varies, and that the two species may not be distinct.

R. tetragyna has been long in cultivation in Kew and elsewhere, and forms a far finer decorative plant for the conservatory than any form of *R. trigyna* hitherto introduced.

Descr. A glabrous shrub two to four feet in height, with terete branches and herbaceous branchlets. *Leaves* crowded near the tips of the branches, four to six inches long, spreading and decurved, elliptic lanceolate or oblanceolate, acuminate, obtusely serrulate or crenulate, narrowed into a short petiole, pale green; nerves few, strong beneath, nervules reticulate; stipules very minute. *Flowers* in terminal sessile corymbose cymes; pedicels half to one inch long. *Sepals* five, two-thirds of an inch long, elliptic-lanceolate, acuminate, concave, smooth, erect. *Flowers* about two inches in diameter. *Petals* five, pale golden yellow, claws forming a tube longer than the calyx, each with a narrow membranous seed on the face; blade two-thirds to three-fourths of an inch long and broad, broadly obovate. *Stamens* five; filaments slender, erect, united at the base into a short tube, with a short filiform staminode between each, and five glands at the base of the tube. *Ovary* subglobose, three- to four-celled, each cell biloculate; styles three to five, very slender, free or united slightly at the base, stigmas capitate; ovules one in eac ellus. *Capsule* globose, coriaceous, splitting into as mar perfectly two-celled one-seeded cocci as there are styles. *Seeds* angular, albumen a thin coat over the straight embryo.—*J. D. H.*

Fig. 1, Calyx and stamens; 2, portion of base of tube of filament with one perfect stamen, alternating with slender staminodes; 4, transverse section of ovary:—*all enlarged*.

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Tab. 7137.

CARAGUATA angustifolia.

Native of New Granada.

Nat. Ord. Bromeliaceæ.—Tribe Tillandsieæ.

Genus Caraguata, *Lindl.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 668.)

Caraguata *angustifolia*; acaulis, cæspitosa, foliis pluribus linearibus acuminatis obscure lepidotis facie canaliculatis, pedunculo brevi foliis reductis occulto, floribus in spicam brevem densam multifariam aggregatis, bracteis splendide rubris inferioribus ovato-lanceolatis centralibus oblongis, calycis segmentis parvis oblongis, corollæ luteæ tubo cylindrico, segmentis brevibus oblongis obtusis, staminibus ad corollæ faucem uniseriatis filamentis brevissimis, antheris primum connatis demum liberis.

C. angustifolia, *Baker in Gard. Chron.* N. S. vol. xxii. p. 616; *Handb. Bromel.* p. 144.

Guzmania Bulliana, *André in Rev. Hort.* 1886, p. 324.

G. angustifolia, *Wittm. in Engler Jahrb.* vol. xi. p. 62.

This is a very interesting and distinct dwarf Bromeliad. Both the bracts and flowers are brightly coloured, and keep so for a long time, and it differs greatly in habit from all its allies by its numerous narrow long-pointed leaves. Botanically it forms a link of connection between *Caraguata* and *Guzmania*, which only differ from one another by the stamens of the latter being permanently syngenesious. It was first flowered at Kew in 1884, the plant being presented by Messrs. Veitch, and gathered by Kalbreyer whilst collecting for them in New Granada. Our drawing was made from a plant that flowered at Kew this summer. It has also been collected by Lehmann at a height of four thousand feet above sea-level on the banks of the Rio Dagua.

Descr. Acaulescent, densely tufted. *Leaves* thirty or more in a rosette, linear acuminate from an ovate base, half a foot long, half an inch broad at the base of the blade, dull green, obscurely lepidote, channelled down the face. *Peduncle* three or four inches long, quite hidden by the crowded stem-leaves. *Spike* dense, simple, multifarious; bracts large, bright scarlet, the outer ovate-lanceolate,

acuminate, the inner oblong. *Calyx* (including ovary) half an inch long; segments oblong, obtuse. *Corolla* lemon-yellow, two or two and a half inches long; tube cylindrical; segments oblong, obtuse. *Stamens* inserted in a single series at the throat of the corolla-tube; filaments very short; anthers connate in bud, free in the expanded flower. *Ovary* ampullæform; style long; stigmas ovate, not twisted.—*J. G. Baker.*

Fig. 1, A flower complete, natural size; 2, top of corolla, cut open; 3, an anther, seen from the back; 4, top of style and stigmas:—*all enlarged.*

M. S. del, J.N Fitch lith.

Vincent Brooks, Day & Son imp

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Tab. 7138.

NEPENTHES Curtisii.

Native of Borneo.

Nat. Ord. Nepenthaceæ.

Genus Nepenthes, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 116.)

Nepenthes *Curtisii*; alte scandens, robusta, foliis junioribus petiolis et inflorescentia puberulis, foliis ascidiiferis longe petiolatis lineari-oblongis basi rotundatis acutisve, apice acutis rotundatis v. 2-lobis, nervis obscuris, ascidiis 6–8 poll. longis sub cylindraceis viridibus purpureo marmoratis, alis (in foliis senioribus obsoletis) dentato-fimbriatis, ore ovato in collum producto, peristomio lato recurvo tenuiter costato, operculo ovato-cordato dorso basi et antice infra apicem cornuto, costa intus basi in laminam brevem producta, pedunculo masc. gracili floribusque pubescentibus, racemo elongato simplici laxe multifloro, bracteis minutis, pedicellis pollicaribus gracilibus, floribus ½ poll. diam. albis extus stellatim puberulis, perianthii segmentis ellipticis, staminum columna segmentis paullo breviore, antheris ad 6–8 oblongis uniseriatis in capitulum depressum connatis.

N. Curtisii, *Masters in Gard. Chron.* 1887, vol. ii. pp. 681, 689, fig. 133.

This appears to be a very distinct species. Dr. Masters, who has very carefully described flowerless specimens, suggests the possibility of its proving (when the flowers should be known) a form of *N. Rafflesiana* (Plate 4285); but this last differs in the stout pitchers and dense raceme of dark red flowers and in the short anthers; or of *N. Boschiana*, in which the stem is 3-angled, leaves scaberulous beneath and the male raceme shorter and denser fld. Its nearest ally appears to me to be *N. Veitchii*, *mihi* (*N. villosa*, of this work, t. 5080; not the true *villosa*), which has uniseriate anthers, and an operculum with a spur under its tip and a lamella at its base; but which differs in its very stout habit, and villosity, and in the much broader leaves and larger pitcher with a very broad peristome and broader wings, as also in the short stout dense-fld. racemes.

The plant from which the figure of the inflorescence is taken was obtained from Messrs. Veitch, who imported the species through Mr. Curtis when collecting for their firm in Borneo. It flowered in the Royal Gardens in

January of this year. The pitcher itself was kindly sent by Mr. Veitch for figuring.

Descr. A tall climber; stem stout; young parts petioles and inflorescence finely pubescent. *Leaves* long-petioled, linear-oblong, obtuse, six to eight inches long by two to four broad, thinly coriaceous, pale green, midrib yellow above, apex rounded, base acute narrowed into a stout petiole three to six inches long, and sheathing at the very base; cirrhus six to eight inches long, slender, yellowish mottled and streaked with red-brown. *Pitcher* in its most perfect form eight to ten inches long by two broad, nearly cylindric but narrowed towards the base, yellow-green mottled and marbled with red-brown; mouth ovate, produced upwards into a beak, with a spine at the back; peristome half an inch broad, very finely striated, brown, denticulate on the margin; operculum orbicular-ovate, acute, margins waved, midrib with a long spine on the under surface underneath the tip, and a short rounded vertical lamella at the base; wings continuous from the top to near the base of the pitcher, one-fourth of an inch broad, margined with rather distant red soft setæ as long as the wing is broad; pitcher, from lower leaves are more trumpet-shaped with narrow wings or none. *Peduncle* of male fl. four to six inches long, pubescent, green, as thick as a thin quill. *Male raceme* eight to ten inches long, unbranched, lax-fld., erect; rachis rather slender, green; bracts minute; pedicels an inch long, solitary or in pairs, slender, pubescent. *Male flowers* half an inch in diameter, white; sepals elliptic, obtuse, reflexed, pubescent without, glabrous and glandular within. *Staminal column* nearly as long as the segments of the perianth; anthers about six or eight, oblong, uniseriate in a depressed head.—*J. D. H.*

Fig. 1, Flower bud; 2, flower :—*both enlarged.*

M. S. del, J. N. Fitch lith.

Vincent Brooks, Day & Son Imp

Tab. 7139.

VANDA Amesiana.

Native of Cambodia.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Vanda, *Br.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 578.)

Vanda *Amesiana*; caule brevi radicibusque crassis, foliis crassis rigidis semiteretibus supra concavis v. profunde canaliculatis junioribus pugioniformibus a basi semiamplexicaule ad apicem acutam sensim attenuatis, racemo valido simplici v. ramoso stricto viridi purpureo maculato laxe multifloro, bracteis parvis, floribus 1-1½ poll. diametro, sepalis petalisque ovato-oblongis obtusis subsimilibus albidis, labello sepalis breviore late panduriformi albo roseo striato lobis lateralibus brevibus rotundatis, terminali late cuneato truncato undulato lateribus deflexis, disco 5-carinato carinis intra apicem obsoletis basi in callum quadratum postice lobatum reflexum desinentibus, calcare brevi conico obtuso.

V. Amesiana, *Reichb. f. in Gard. Chron.* 1887, i. p. 764 (name only); 1889, i. 233; *Warner & Williams' Orchid. Alb.* vol. vii. t. 296.

I find no published description of this plant by Reichenbach; the first notice of it which I have discovered is under "Orchid Notes and Gleanings" in the 1887 volume of the "Gardener's Chronicle." There is however a very fair figure with description in Warner and Williams' Orchid Album, though the figure gives no more idea than does ours of the great size and number of the panicles that the plant bears. According to the accounts given of an imported lot in the "Gardener's Chronicle," the inflorescence attains a height of two feet six inches, and one imported specimen is described as bearing eight panicles and 600 flower buds. Reichenbach suggests that there may have been more than one species in that imported lot, but I know of no confirmation of this hypothesis.

V. Amesiana is a remarkable species, differing from all others known to me in the enormously stout stem and roots, and the hard rigid leaves, the young of which are strict and like poinards with a groove down the blade, the older are broader and recurved, concave on the upper surface and terete on the back. The flowers are sweet-scented.

The specimen here figured was procured from Messrs.

October 1st, 1890.

Hugh Low and Co. of Clapton in 1888, and flowered in January of this year.

DESCR. *Stem* two to three inches or more long, cylindric, as thick as the thumb, greenish-brown; stem-roots short, white, one to two inches long, fully one-third of an inch in diameter. *Leaves* close set, very fleshy and rigid, narrowed from the semiamplexicaul base to the acute tip, the younger four to six inches long and poinard-shaped with a groove down the centre, the older longer, six to eight inches, recurved, semi-terete with a concave face and rounded back, the margins rounded dark green. *Peduncle* stout, erect, with the strict simple or branched twenty to eighty flowered racemes ten to twenty-four inches long; peduncle and rachis green blotched with red-brown. *Bracts* short, semicircular, white. *Flowers* one to one and a half inches diam.; perianth white with faint rosy ridges on the lip; pedicel with ovary one inch long, white streaked with rose on the ribs of the latter. *Sepals* and *petals* subsimilar, ovate-oblong, very obtuse. *Lip* nearly as long as the sepals, broadly cuneate, truncate, undulate; side lobes small, rounded, white; mid-lobe with decurved sides and five ridges on the disk, which are not continued to the margin in front, and behind converge into a quadrate reflexed callus with crenate tip which lies between the lateral lobes; spur pointing backwards, short, conical, white. *Column* short, thick, white; anther small, obtusely beaked; pollinia globose, strap linear, rather broad, gland broad, semicircular.—*J. D. H.*

Fig. 1, Lip; 2, column; 3, anther; 4 and 5, pollinia:—*all enlarged.*

M.S. del, J.N. Fitch lith.

Vincent Brooks, Day & Son

L. Reeve & Co. London.

Tab. 7140.

IRIS Danfordiæ.

Native of Armenia.

Nat. Ord. Irideæ.—Tribe Moræeæ.

Genus Iris, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 686.)

Iris (micropogon) *Danfordiæ*; bulbo anguste ovoideo, tunicis elongatis pallide brunneis arcte intertextis, radicibus fibrosis, foliis 2–3 hysteranthiis anguste linearibus glabris 4-gonis angulis costatis, scapo brevissimo, spathæ uniflorae valvis 2 linearibus membranaceis, pedicello ovario cylindraceo aequilongo, perianthii pallide aurantiaci tubo 1½ pollicari, segmentis exterioribus oblongo-spathulatis lamina oblonga obtusa v. acuta reflexa obscure barbata v. nuda sparse fusco v. viridi punctata, interioribus minimis subulatis porrectis, styli ramis luteis perianthium subæquantibus bifidis lobis dimidiato-ovatis acutis, staminibus ½ poll. longis, antheris linearibus citrinis filamento longioribus.

I. Danfordiæ, *Baker in Journ. Bot.* 1876, p. 265.

I. Bornmuelleri, *Haussk. in Flora*, 1889, p. 140.

I. Amasiana, *Born. in Møller. Gardn. Zeit.* (*ex Haussk. in sched.*).

Iris Danfordiæ was discovered by the lady whose name it bears, on the Cilician Taurus, in the beginning of March, 1875, at an elevation of about four thousand feet. The exact spot was on the northern side of the Amascha Mountain, which is a continuation of the Ala Dagh range. In 1889 it was gathered in the same mountains by Herr Bornmueller, Inspector of the Belgrade Botanical Gardens, and dedicated in the same year by Haussknecht, to that traveller, with the observation that *I. Danfordiæ* differs from it in the thin texture of the tunic of its bulb, a distinction that the specimens do not confirm.

The specimen figured was grown from roots sent by Herr Max Leichtlin in 1889, and flowered in a cool frame in the Royal Gardens in February of this year. Flowers have also been communicated by Mr. Gumbleton, and leaves by Baron von St. Paul, of Fischbach, in Silesia. It is very fragrant.

Descr. Dwarf. *Root* narrowly ovoid, about an inch long, clothed with a subcylindric tunic one to one and a half inch long of pale brown interlaced fibres, that reach

the same height, and form a truncate mouth to the tunic; roots fibrous. *Flowering stem* two to four inches high, closely invested with many obtuse or subacute imbricating pale sheaths. *Leaves* produced after flowering, twice as long as the flowering stem, narrowly linear, hollow, four-angled, with thickened angles, tip suddenly contracted into an oblique cusp. *Scape* very short. *Spathes* two, linear, membranous, one-flowered; pedicel about as long as the cylindric ovary. *Perianth* about an inch and a half in diameter; tube an inch and a half long; outer segments oblong-spathulate, obtuse or acute, orange-yellow, with a few brown or greenish spots; upper third reflexed; disk with an obscure beard or none; inner segments minute, with subulate tips that project between the base of the outer. *Style* as long as the perianth, golden yellow, bifid; lobes semi-ovate, acute. *Stamens* with linear yellow anthers, which are larger than the filaments.—*J. D. H.*

Fig. 1, Transverse section of leaf; 2, stamen; 3, portion of style showing the stigma:—*all enlarged.*

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Tab. 7141.

CLERODENDRON PANICULATUM.

Native of Eastern Tropical Asia.

Nat. Ord. Verbenaceæ.—Tribe Viticeæ.

Genus Clerodendron, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 1155.)

Clerodendron *paniculatum*; fruticosum, puberulum, ramis teretiusculis, ramulis 4-gonis, foliis inferioribus amplis longe petiolatis orbiculatis hastatisve acuminatis cuspidatisve profunde cordatis lobis incumbentibus breviter 5-lobis lobis acutis basi trinerviis, supra læte viridibus, subtus sublente creberrime lepidotis, axillis fimbriatis, supremis sessilibus, paniculæ ramis brachiatis apices versus cymoso-multifloris, inferioribus erectis supremis decurvis, floribus coccineis flavis v. albidis, calycis parvi segmentis oblongis obtusis, corollæ hypocrateriformis tubo gracili calyce pluries longiore, limbi lobis subæqualibus patentibus oblongis obtusis, filamentis corolla multoties longioribus, antheris parvis, ovario glaberrimo, stigmatibus angustis.

C. paniculatum, *Linn. Mant.* p. 90; *Ait. Hort. Kew. Ed.* 2, vol. iv. p. 64; *Vahl. Symb.* vol. ii. p. 74; *Bot. Reg.* t. 406; *Reichb. Fl. Exot.* t. 208; *Schauer in DC. Prodr.* vol. xi. p. 668; *Clarke in Fl. Brit. Ind.* vol. iv. p. 593.

C. splendidum, *Wall. Cat.* No. 1803.

Volkameria angulata, *Lour. Fl. Cochin.* p. 389.

A very widely distributed shrub in Eastern Asia, and a great ornament, whether in the jungle or in gardens. In Eastern India proper it ranges from Tenasserim southwards throughout the Malayan Peninsula; whence it extends to Java, Siam, Cochin China, Eastern China and Formosa. It varies a good deal in the form of the leaves from orbicular in outline to hastate, and in colour from its usual scarlet to white or yellowish. The panicles are often a foot and more high, and almost as broad. According to Ker, who published an excellent figure and description of it in the Botanical Register, it was introduced into England in 1809, from Penang, by Mr. Evan, of Stepney.

Seeds of *C. paniculatum* were sent to Kew early in 1888 by G. M. H. Playfair, Esq., H.B.M. Consul at Taiwan, in Formosa, which germinated, and the plants grew so rapidly in a stove that by the end of September in the following year they had formed a branching shrub two

feet high, and bore the brilliant inflorescence here represented.

Descr. A branching puberulous shrub, two to three feet high, with terete green stems and herbaceous four-angled branches, bearing spreading panicles of scarlet flowers; internodes of branches and panicles fimbriate. *Leaves* three to six inches in diameter, orbicular or hastately cordate, acuminate or cuspidate, shortly, broadly, acutely five-lobed, base three nerved and deeply cordate with overlapping lobes, bright green above, beneath pale, and clothed with minute lepidote scales; upper leaves small, shortly petioled or sessile. *Panicle* a span to a foot long, and nearly as broad, with leafy bracts at the internodes; rachis green, tetragonous; branches opposite, three to six inches long, the lower pairs suberect, the upper horizontal and drooping, all bearing towards their apex a many-fld. cyme of drooping usually scarlet flowers with subulate bracteoles; pedicels rather short. *Calyx segments* subequal, one-sixth of an inch long, oblong, obtuse. *Corolla* tubes half an inch long, slender, terete, three or four times as long as the calyx; limb of five oblong obtuse spreading lobes about as long as the tube. *Stamens* two to three times as long as the corolla; filaments very slender, scarlet; anthers small, greenish. *Ovary* glabrous; style slender, stigmatic arms subulate.—*J.D.H.*

Fig. 1, Portion of under surface of leaf; 2, lepidote scale from the same; 3, portion of calyx and ovary; 4 and 5, anthers; 6, style:—*all enlarged.*

Tab. 7142.

SACCOLABIUM BELLINUM.

Native of Burma.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Saccolabium, *Blume*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 578.)

Saccolabium (Calceolaria) *bellinum*; caule brevi robusto, foliis loriformibus medio canaliculatis apice 2-fidis lobis inæqualibus obtusis, pedunculo brevi crasso multifloro, floribus corymbosis 1–1½ poll. latis, sepalis petalisque subsimilibus crassis obovatis obtusis aurantiacis rubro-purpureo maculatis, labelli sacco hemispherico, lobis lateralibus nullis, limbo lunato albo basi aureo rubro maculato margine eroso, disco antice aspero postice spinulis mollibus dense obsito, columna brevissima crassa, rostello brevi recurvo, anthera 2-loba.

S. bellinum, *Reichb. f. in Gard. Chron.* 1884, vol. i. p. 174, and 1887, vol. i. p. 145; *Warner & Williams's Orchid. Alb.* t. 156; *Hook. Fl. Brit. Ind.* vol. vi. p. 61 (*ined.*)

Saccolabium bellinum belongs to the section *Calceolaria*, which consists of eighty or more species, distinguished by their short stems, lorate rather flaccid leaves, and short stout peduncles bearing corymbs of flowers of a very uniform structure; the petals and sepals are subsimilar, equal and fleshy, obovate, obtuse, yellow, and usually more or less blotched with red or purple; the lip consists of a bucket-like sac, the mouth of which is truncate or raised on either side with short side lobes or ears, and the limb or midlobe of the lip is horizontal and lunate, embracing the anterior part of the sac just below its mouth, and having an erose or fimbriate margin, and thickened, smooth, or echinate and ciliate disk. As thus defined the section is well distinguished from all other *Saccolabia*, except section *Acampe*, which differs chiefly in having a longer stem, rigid keeled leaves and a more strongly tubercled or thickened midlobe of the lip. Lindley, indeed, regards *Acampe* as a genus, no doubt overlooking the fact that its most essential characters were those of the *Calceolaria* section of *Saccolabium*.

All the species of the *Calceolaria* section are natives of tropical India and the Malayan Peninsula and Islands; two

have been previously figured in this work, namely, *S. denticulatum* (Plate 4772), which is possibly not the plant first published under that name in Paxton's Magazine (v. vii. t. 145), having a thickly fimbriate midlobe of the lip. 2, *S. bigibbum* (Plate 5767), a species with much shorter leaves, unspotted flowers and a fimbriate lip with a smooth disk that bears a two-lobed callus. *S. bellinum* is much the largest flowered species of the section, if not of the genus; it was first sent from Burma by the collector Boxall, and is, as yet, only known as a cultivated plant. The specimen here figured was purchased at an auction in 1884; it flowers yearly in early spring, and remains in this condition for a month or more.

Descr. *Stem* three to four inches long, as thick as a swan's quill. *Leaves* close set, distichous, four to eight inches long, lorate, deeply unequally bifid, channelled above, pale green. *Peduncle* short, stout, recurved, dark green speckled with brown. *Flowers* one to one and a quarter inches in diameter, corymbose; bracts short, oblong, obtuse, brown; pedicel with ovary two-thirds of an inch long, stout. *Perianth segments* spreading and incurved, fleshy, obovate-oblong, obtuse, yellow, blotched with red-brown or purplish brown. *Lip* a hemispheric, yellowish, spotted fleshy sac with a truncate mouth, and a lunate white limb with a yellow spotted thickening at the very base, margin of limb erose, surface echinulate, the processes rising into long erect soft papillæ or spines at the base of the limb. *Column* very short and thick, rostellum short, recurved; anther two-lobed; pollinia globose, strap linear; gland bifid.—*J. D. H.*

Fig. 1, Column and lip; 2, apex of column with pollinia *in situ*; 3, anther; 4, pollinia:—*all enlarged.*

M S. del. J.N.Fitch lith

L Reeve & Cº London

Tab. 7143.

ACINETA densa.

Native of Central America.

Nat. Ord. Orchideæ.—Tribe Vandeæ.

Genus Acineta, *Lindl.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 551.)

Acinéta *densa*; pseudobulbis ellipsoideis, foliis oblanceolatis acutis plicatis, pedunculo brevi, racemo elongato multi- et densifloro pendulo, bracteis oblongis pallidis punctatis, floribus magnis flavis, sepalis late ovato-oblongis obtusis concavis, petalis minoribus obovato-oblongis obtusis pallide maculatis, labelli aurei maculati breviter unguiculati hypochilo concavo intus versus apicem dente obtuso aucto, lobis lateralibus amplis erectis subreniformibus basi angustatis, lobo terminali parvo linear-oblongo incurvo apice dilatato supra concavo basi contracto verruccoso plagis magnis sanguineo-rubris ornato, disco inter lobos laterales callo magno late 3-carinato et postice et antice crenato instructo, columna elongata crassa dorso pubescente antice maculata superne 2-alata.

A. densa, *Lindl. in Part. Fl. Gard.* vol. i. p. 91, fig. 63; *Reichb. f. in Walp. Ann.* vol. i. p. 784, vol. iii. p. 546, vol. vi. p. 610; *Orchid. Centr. Amer.* p. 21, t. 3; *Floral Magaz.* vol. i. p. 16.

A. Warscewiczii, *Klotzsch in Allg. Gartenzeit.* 1852, p. 145.

A magnificent orchid, from the great length of its many-flowered raceme, which attains three feet, its large flowers and their colour, which is a clearer yellow than any of the genus hitherto described except *A. chrysantha*. Lindley regarded it as nearest to *A. Banksii*, from which it differs in its more concave hypochile, with the tooth not warted at the base, in its remarkably warted epichile, its long column, and other characters. It is a native of Tulialba in Costa Rica, whence it was sent by the late Mr. Skinner in 1849 to the Royal Horticultural Society. Under *Lueddemannia Pescatorei*, Plate 7123, I made some observations on that genus, and on *Peristeria* and *Acineta* and their allies, in which I have stated that the latter genus is distinguished by its short thick column; but this character must, I fear, be given up as distinctive, for the column of *A. densa* is as long and hardly more stout than that of the above cited *Lueddemannia*, as a comparison of the two figures will show. The fact is that the columns are not well represented in the published figures of several *Acinetas*;

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and where it is, this organ is decidedly short and thick. If *Lueddemannia* is to be kept generically separated from *Acineta* the characters must be drawn from the form of the calli and side lobes of the lip, which in my opinion are only sufficient for sectional purposes, when the habit and other characters are the same. *L. densa* flowered simultaneously in the Glasnevin Botanical Gardens and at Kew, in October of last year. The portion of a raceme here figured is from the former source, the foliage from the latter.

Descr. *Pseudobulbs* tufted, three to four inches long, narrowly ellipsoid or fusiform, smooth, sheathed at the base. *Leaves* three to four on the pseudobulb, twelve to eighteen inches long by two to three inches broad, oblanceolate, acute, bright green, plaited. *Peduncle* short, stout, sheathed; raceme two to three feet long, very many and dense-fld., pendulous; rachis stout, green; bracts half an inch long, oblong, acute, pale brown, speckled; pedicel with ovary an inch long, very stout; flowers pale golden yellow, perianth connivent. *Sepals* nearly two inches long, ovate-oblong, obtuse, fleshy, very concave. *Petals* smaller, more obovate, concave, speckled with red round the edges, and with larger scattered pale spots over the surface. *Lip* very thick and fleshy, rather longer than the petals; claw or hypochile broad, short, concave; side lobes large, subreniform, erect, concave, narrowed at the base, spotted like the petals; mid-lobe much smaller and shorter than the side lobes, very thick and fleshy, narrow, incurved with a rather dilated subquadrate concave tip, golden yellow with large prunella blotches towards the base; disk with a long saddle-like three-ridged callus between the side lobes, which has crenate truncate ends. *Column* long, stout, pubescent, with rounded wings above the middle; anther small; pollinia pyriform; strap linear, gland rather small.—*J. D. H.*

Fig. 1, Lip and column seen laterally; 2, the same viewed from above; 3, column 4, pollinia :—*all enlarged.*

Tab. 7144.

EUCHARIS Bakeriana.

Native of the United States of Columbia.

Nat. Ord. Amaryllideæ.—Tribe Amarylleæ.

Genus Eucharis, *Planch.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 731.)

Eucharis *Bakeriana*; bulbis ovoideis, foliis 8–12-pollicaribus ellipticis v. elliptico-lanceolatis acutis multistriatis saturate viridibus in petiolum crassum elongatum basi angustatis, scapo subcompresso glauco, umbella 4–6 flora, spathis 2, 1–2 pollicaribus elongato-lanceolatis, pedicellis $\frac{1}{2}$-2 pollicaribus, perianthii tubo $1\frac{1}{2}$-pollicari albo medio decurvo cylindraceo superne infundibulari, limbo $2\frac{1}{2}$ poll. diamet. segmentis ovatis obtusis v. subacutis recurvis albis, interioribus paullo majoribus, staminum coronæ lobis rotundatis retusis albis medio pallide stramineis, filamentis subulatis, antheris linearibus, ovario depresso trilobo basi et apice intruso viridi, **loculis pauci-ovulatis.**

E. Bakeriana, *N. E. Br. in Gard. Chron.* 1890, vol. i. p. 416, fig. 61.

Eucharis grandiflora, figured at Plate 4971 (better known as *E. amazonica*), and *E. candida*, Planch, were for many years the only recorded species of the genus. Seven are now known, all natives of the Andes of Columbia, and all having the same characters of habit and foliage. I am indebted to Mr. J. G. Baker, F.R.S., for the following *resumé* of them. Of these seven, *E. subedentata*, Benth. (*Caliphruria edentata*, Baker in Bot. Mag. t. 6289) may be recognized at a glance by its small flowers. *E. Sanderii*, Baker (in Bot. Mag. t. 6676) differs from all of the other fine large-flowered species in the staminal cup being almost wholly adnate to the tube of the perianth. *E. Lehmanni*, Regel (in Gartenfl. t. 1300, f. 1) has two very large teeth on either side of the free part of the filament. *E. Mastersii*, Baker (in Bot. Mag. t. 6831) has only a very narrow free staminal tube; it may be a hybrid between *grandiflora* and *Sanderii*. *E. candida*, Planch. (in Flora des Serres, t. 788) has much smaller flowers than *E. grandiflora* or *Bakeriana*, together with nearly free filaments, that are quadrate at the base. *E. grandiflora*, Planch. (in Bot. Mag. t. 4971 *E. amazonica*, Hort. Lind.), the best known species, has large flowers and a broad staminal tube, with the lobes connate nearly throughout. Lastly *E. Bakeriana* has,

speaking broadly, the perianth of *grandiflora* and the stamen of *candida*.

The specimen of *E. Bakeriana* here figured was sent to Kew in January and again in May of this year, in full flower, by Messrs. F. Sander and Co., of St. Albans, by whom it was introduced into cultivation.

Descr. *Bulb* ovoid, sheathed with brown scales. *Leaves* four to five, stoutly petioled; blade ten to eighteen inches long by three to six inches broad, elliptic, subacute or acuminate, narrowed into a petiole, closely striate by many obscure nerves, very dark green; petiole about as long as the blade. *Scape* ten to eighteen inches high, as thick as a swan's quill, slightly compressed, smooth, green; spathes two, narrowly lanceolate from a broad base, two to three inches long; umbels four- to six-flowered; pedicels one half to two inches, stout, green. *Flowers* two and a half inches in diameter, pure white; tube of perianth one and a half inches long, slender, decurved from below the middle, funnel-shaped at the base of the six spreading ovate or oblong subacute or obtuse segments; the inner segments rather the longer and more elliptic. *Staminal crown* free to the base of the segments; of six filaments with rounded or retuse coherent bases, and suddenly contracted into subulate upper halves; anthers linear. *Ovary* depressed, intruded at the base and top, deeply three-lobed, three-celled; style slender, stigma shortly 3-lobed; ovules few in each cell.—*J. D. H.*

Figs. 1 and 2, stamens; 3, style and stigma; 4, transverse section of ovary:—*all enlarged.*

M[illegible]el J.N.Fitch lith.

Vincent Brooks, Day & S[illegible]

Tab. 7145.

IRIS sindjarensis.

Native of Mesopotamia.

Nat. Ord. Irideæ.—Tribe Moræeæ.

Genus Iris, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 636.)

Iris (Juno) *sindjarensis*; bulbo oblongo tunicis membranaceis, foliis distichis lanceolatis confertis firmis viridibus, caule brevissimo 1-2-cephalo foliis occulto, spathæ valvis exterioribus lanceolatis viridibus, perianthii lilacini tubo elongato, segmentis exterioribus oblongo-cuneatis cristâ lutea inconspicua carinatis, segmentis interioribus oblongo-unguiculatis parvis deflexis, styli cristis ovatis imbricatis reflexis.

I. sindjarensis, *Boiss. et Haussk. in Boiss. Fl. Orient.* vol. v. p. 422.

This is another of the bulbous species of Iris allied to *caucasica*, *orchioides*, and *palestina*. It is distinguished by its short stem, crowded green lanceolate leaves, and lilac flowers. It was discovered about 1865 in Mesopotamia by Dr. Haussknecht, in one of those journeys which have added so much to our knowledge of Oriental plants. Much later it was introduced into cultivation by our esteemed correspondent, Herr Max Leichtlin of Baden Baden; and our drawing was made from a plant which he sent to the Royal Gardens which flowered in a cool frame last February.

Descr. *Rootstock* an oblong bulb, with cylindrical root-fibres; outer tunics membranous. Produced *leaves* about eight, crowded, lanceolate, distichous, acuminate, firm, bright green, an inch broad. *Stem* very short, hidden by the leaves, bearing one or two clusters of flowers; spathes two inches long; outer valves lanceolate, pale green at the flowering time. *Perianth* slaty lilac; tube protruded about an inch from the spathe; outer segments oblong cuneate, two inches long, under an inch broad, slaty lilac with radiating lines of darker lilac, and with an inconspicuous yellow crest down the lower two-thirds; inner segments oblong-unguiculate, an inch long, drooping from between the claws of the outer segments. *Style-branches* half an inch broad; crests ovate, imbricated, reflexed.—*J. G. Baker.*

Fig. 1, Front view of anther; 2, back view of anther; 3, apex of style with stigma and crests:—*all enlarged.*

M. S. del, J. N. Fitch lith.

Vincent Brooks, Day & Son imp.

Tab. 7146.

ARUNDINARIA Simoni. *Var.* variegata.

Native of Japan.

Nat. Ord. Gramineæ.—Tribe Bambuseæ.

Genus Arundinaria, *Michaux;* (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 1207.)

Arundinaria *Simoni;* culmis cœspitosis gracilibus 12–40-pedalibus, ramulis fastigiatis gracillimis teretibus superne floriferis, foliis 6–8 poll. longis $\frac{1}{3}$–$\frac{1}{2}$ poll. latis breviter petiolatis auguste lineari-lanceolatis attenuato acuminatis minute tessellatis basi attenuatis acutis subtus glaberrimis v. costa minutissime ciliolata, marginibus serrulatis, vaginis ciliatis, ore pilis elongatis caducis instructa, ligula brevissima ciliolata, spicis simplicibus rarius divisis suberectis gracile pedunculatis, rachi puberula, spiculis 6–10 subremotis $\frac{1}{3}$–$\frac{1}{2}$ poll. longis unifloris, gluma inferiore vacua solitaria lanceolata acuminata 5-nervi, palea glumæ æquilonga ciliata, lodiculis ciliolatis, stylis 2 basi brevissime connatis.

A. Simoni, *Rivière in Bull. Soc. d'Acclimat.* 1878, p. 774, figs. 43–50. *Les Bambous*, p. 286, figs. 43–47, and p. 288, figs. 4–50, and p. 295.

A. Fortunei, *Fenzi in Gard. Chron.* 1876, vol. ii. p. 773, and *Munro l. c.* p. 774 (*sine descript.*) (*non. Riv.*)

Bambusa Simoni, *Carr.*

Var. *variegata*, foliis viridibus albo striatis.

Arundinaria Simoni was first described under that name by Rivière in 8178, from specimens cultivated at Algiers, and which had been sent there from the Jardin des Plantes at Paris. It was introduced (in 1862) into the latter establishment from China, by Consul Eugene Simon, with the information that it was a native of Japan. It had, before it flowered, been known as *Bambusa Simoni*, Carriere. The same plant, in a flowering state, and under the name of *Bambusa Simoni*, was sent in 1876 to M. Fenzi of Florence, and to Colonel Munro in this country. These gentlemen, confounding it with a plant introduced by Fortune from Japan, and which was known in gardens as *Bambusa Fortunei*, agreed in proposing for it the name of *Arundinaria Fortunei*, but gave no description. The name *A. Fortunei* cannot therefore take precedence of *Simoni*; added to which there is no evidence that Fortune ever saw *A. Simoni*, and very good evidence that what he introduced was a different species.

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The plant introduced by Fortune is described (as to foliage only) and figured by Van Houtte (Flore des Serres, t. 1535) in 1863, that is soon after Fortune's return from his last journey to Japan and China, as "*Bamb. Fortunei*, foliis niveo-vittatis." Van Houtte says of it, "a charming plant, which we find at Mr. John Standish's, amongst the plants brought by Robert Fortune from China." The figure represents a dwarf plant with long cilia on the margin of the leaf, which is rounded at the base. Of this, now one of the most generally cultivated of all the hardy Bamboos, the flower is unknown; it is common in Japan, whence herbarium species have been sent by various collectors, and it is readily to be distinguished from *B. Simoni* by the different habit, broader leaves, finely hairy underneath, and more rounded at the base. It is probably, as Miquel has suggested (Ann. Bot. Lugd. Bat. ii. 285) *B. variegata*, Siebold; it is the *Arundinaria Fortunei, foliis variegatis*, of Rivière (in Bull. Socr. d'Acclimat. 1878, p. 797) who says of it that in Algeria it grows only twenty to twenty-four inches in height, with culms one-sixteenth to one-eighth of an inch in diam., and has the habit of a *Phalaris*. It is *B. picta*, Sieb. and Zucc. (not of Lindley) according to specimens collected by Siebold in Japan, and which are preserved in the Kew Herbarium. According to the Kew collector Oldham, it is common, quite wild, on hills behind Kanagawa.

It may be well to call attention here to two published allied species of Bamboo of which the flowers are unknown, they are *B. argenteo-striata*, Regel. Gartenfl. 1865, 363, t. 490, f. 5 (a miserable drawing of a single leaf). It is described as having culms four to five feet high, and as thick as a swan's quill, quite glabrous leaves with rounded bases, and as differing from *B. Fortunei* in the want of hairs on the margin and nerves of the leaves. It was introduced by Maximowicz from gardens in Japan, and may be only *Fortunei*. The other is *B. viridi-striata*, Sieb. mss. ex André, Ill. Hortic. vol. xix. p. 319, t. 108, introduced from Japan apparently by both Siebold and Maximovicz, it has short slender brittle culms, and leaves broader than those of *Simoni* and *Fortunei*, striped gold and green, and with a rounded or even cordate base.

A. Simoni is a hardy tufted bamboo, in this country

Cont. 4 pages further on

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Tab. 7147.

PEREskia aculeata.

Native of Tropical America.

Nat. Ord. Cacteæ.—Tribe Opiniliæ.

Genus Pereskia, *Mill;* (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 851.)

Pereskia *aculeata;* arbuscula ramosa, sæpe subscandens, ramulis robustis, pulvinis dense tomentosis glabrisve, spinis rectis et elongatis v. parvis et uncinatis, foliis planis ellipticis elliptico-lanceolatisve rapius obovatis ovatisve et basi cordatis, cymis multifloris, calycis tubo spinosis, petalis numerosis oblongo-obovatis obtusis subacutisve rarius retusis, stigmatibus 5 fusiformibus, bacca globosa sepala foliacea gerente oligosperma.

P. aculeata, *Haworth Syn. Pl. Succ.* p. 198; *Lindl. in Bot. Reg.* t. 1928; *DC. Prodr.* vol. iii. p. 174; *Pfeiff. Enum. Cact.* p. 175; *Pfeiff. & Otto. Abbild. n. Beschr. Cact.* p. 1; *Walp. Rep.* vol. ii. p. 355.

P. longispina, *Haworth l. c.* 198.

Peirescia aculeata, *Zuccarini in Abhandl. Bayr. Akad. Wiss.* vol. ii. p. 696; *Griseb. Fl. Brit. W. Ind.* 303; *Descourl. Fl. Antill.* vol. iv. p. 294; *Forst. Handb. Cact. Ed.* 2, p. 299.

P. Sacharosa, *Griseb. in Goett. Abhandl.* vol. xxiv. p. 141.

Cactus Pereskia, *Linn. Sp. Pl.* p. 671; *Ait. Hort. Kew*, Ed. 2, vol. iii. p. 180.

C. Peirescia, *Spreng. Syst. Veg.* vol. ii. p. 498 (*excl. syn. Bleo*).

C. sarmentosus, &c., *Brown Hist. Jam.* p. 237.

Pereskia aculeata flore albo, &c., *Plum. Nov. Gen.* p. 35, t. 26; *Mill. Gard. Dict.* (1739); *Dillen. Hort. Eltham.* p. 305, t. 217, f. 294; *Linn. Hort. Cliff.* p. 183.

Portulacca Americana, &c., *Pluk. Alm.* p. 135, t. 215, f. 6.

Malus Americana, spinosa, &c., *Commel. Hort. Med.* vol. i. p. 135, t. 30.

Grossularia fructu, &c., *Sloane Jam. Hist.* vol. ii. p. 86; *Ray Hist. Pl.* vol. iii.; *Dendr.* p. 27, No. 5.

Nat. names, Grosseille des Barbades of the French; Barbadoes gooseberry-bush of the English; Blad apple of the Dutch; Sacharosa in Argentine prov.

Though one of the very earliest introduced of tropical shrubs, having been cultivated in the Royal Gardens of Hampton Court in 1696, and ever since in botanical establishments, *Pereskia aculeata* is, from its ragged habit, sickly green foliage, and shyness of flowering, a very little known plant amongst horticulturists. At Kew it has been cultivated ever since the foundation of that establishment, but there is no record of its having flowered till last year, when a plant trained up a rafter of the Succulent House did so (in the month of October), and that is here figured.

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P. aculeata is a very variable plant in habit, foliage, the number of petals, and their colour. It forms a straggling or climbing bush or small tree, the branches of which have been described as twining, though more generally it climbs by means of the spines, which are hooked on young branches, but long and straight in old; the spines are seated on small cushions, which in the older parts are densely tomentose. The bark of the trunk and even young branches is pale and corky. The leaves vary from obovate or almost orbicular to elliptic-lanceolate. The flowers, which are one and a half inches in diameter, have the petals pure white, rosy, or yellowish white with a rosy blush (as in those here figured). The fruit is the size of a small gooseberry, globose, yellowish, transparent, few-seeded, and covered with small spreading leaves, which are the free tips of the sepals. The leaves are used as a pot herb in Brazil, and the berries are eaten throughout the tropics of America. I am not aware that the plant is cultivated for its fruit, it being rather, like our bramble, an inhabitant of waste places. Grisebach's *P. Sacharosa* (the native name in the Argentine provinces) is identical with *P. aculeata*. The var. *longispina*, &c. (*P. longispina*, Haw.) has no character of specific or even varietal value, the short solitary recurved and very long clustered spines being found in the same plant.

The name *Pereskia* was given by Plukenet in honour of Nicol. Fabric. Peiresc, member of Parliament for Aix, in Provence, a very learned man and devoted to botany. It was changed to *Peiresia* by Zuccarini, a wanton change that has not been generally adopted.

It is singular that so common an American plant with an eatable fruit should not have been introduced by the Spaniards, and become an "escape" in the Old World, where I think it would be naturalized with great rapidity. —*J. D. H.*

Fig. 1, A cushion from the older branches with long spines, *of the natural size*; 2, vertical section of flower; 3 and 4, stamens:—*all enlarged*.

[Arundinaria Simoni]

attaining a height of eight to ten feet in the open air, and flowering sparingly. In Algiers it is described by Rivière as forming rhizomes that bury themselves one and a half to two feet, and from which new culms arise in the beginning of May, which during the first year are simple, clothed with spathaceous sheaths, and attain twenty to twenty-five feet in height. Towards the end of the second year these culms ramify in whorls from above downwards and flower. The leaves are eight to ten inches long and quite glabrous; the caryopsis is one half to two-thirds of an inch long, and resembles that of rye. Flowering specimens of this species, under the name of *B. Simoni*, are in the Kew Herbarium from the Jardin des Plantes, from the gardens of Gen. Munro, of Sir J. Walrond, of Mr. Ellacombe, and of Mr. George Paul of the "Old Nurseries," Cheshunt, Herts; and under the name of *B. Fortunei* from the temperate house of the Royal Gardens, Kew, where it flowered in 1877; and under that of *Maximowiczii variegata* from Gen. Munro. The specimen here figured is from a magnificent plant grown by Mr. Paul in a tub in a Camellia house at Cheshunt, the culms of which are fourteen feet high and as thick as the thumb. It was procured from France from M. Samaurez, under the right name. An authentic specimen from Fenzi of his *Fortunei* is also in the Kew Herbarium, and is unquestionably *A. Simoni*.—*J. D. H.*

Fig. 1, Top of sheath with ligula and cilia; 2, under surface of portion of leaf; 3, portion of rachis of spike and glume; 4, pale; 5, lodicule; 6, stamen and pistil; 7, pistil:—*all enlarged.*

Tab. 7148.

RHODOSTACHYS andina.

Native of Chili.

Nat. Ord. Bromeliaceæ.—Tribe Bromelieæ.

Genus Rhodostachys, *Philippi*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 662.)

Rhodostachys *andina*; acaulis, foliis multis dense rosulatis linearibus rigidis falcatis pedalibus vel sesquipedalibus facie glaberis canaliculatis dorso persistenter albo-lepidotis margine aculeis crebris uncinatis stramineis armatis, floribus in capitulum centralem subsessilem globosum aggregatis, bracteis exterioribus ovatis cuspidatis spinoso-serratis, interioribus oblanceolato-oblougis scariosis, ovario clavato-trigono glabro, calycis segmentis lanceolatis albis ovario æquilongis, petalis lanceolatis rubellis, **staminibus styloque petalis longioribus.**

R. andina, *Phil. in Linnæa*, vol. xxix. p. 57; *Baker Handb. Bromel.* p. 28.

Bromelia longifolia, *Lindl. in Paxt. Flor. Gard.* vol. ii. p. 139, tab. 65; *Lemaire Jard. Fleur.* t. 223, non Rudge.

Ruckia Ellemeti, *Regel Gartenfl.* 1868, p. 65, t. 571.

This very ornamental Bromeliad is an inhabitant of the Cordilleras of the northern provinces of Chili. It only requires cool treatment, and at Kew is grown in the cactus-house. It is the plant on which Philippi founded his genus *Rhodostachys*, and Regel, a few years later, his genus *Ruckia*. It seems to have been introduced into cultivation by Mr. Henderson, who exhibited it in flower at one of the shows of the Royal Horticultural Society in August, 1851. For a long time it was confounded with the *Bromelia longifolia* of Rudge, which is a native of Guiana, and now placed in the genus *Streptocalyx*. Our drawing was made from a plant which was flowered by F. D. Godman, Esq., F.R.S., at his residence near Horsham, in November, 1889, and this year we have again received it in flower from H. J. Elwes, Esq., of Cirencester. The sketch showing the general habit of the plant was made in Kew Gardens.

Descr. Acaulescent. *Leaves* about a hundred in a dense rosette, linear, rigid, recurved, a foot or a foot and a half long, an inch broad at the clasping base, half an inch in the middle, deeply channelled down the finally

glabrous face, persistently white-lepidote on the back, armed on the margin with close hooked pungent stramineous spines. *Flowers* very numerous, forming a dense globose nearly sessile central head two or three inches in diameter; outer bracts ovate-cuspidate, spine-margined, slightly tinged with red; inner oblanceolate-oblong, white, scariose, shorter than the calyx. *Ovary* clavate-trigonous, glabrous, under an inch long. *Calyx-segments* lanceolate, white, as long as the ovary. *Petals* lanceolate, bright pink, an inch long. *Stamens* longer than the petals; anthers linear-oblong, spreading, bright yellow. *Style* overtopping the stamens; branches very short.—*J. G. Baker.*

Fig. 1, a complete flower; 2, lepidote scale; 3, petal and two stamens; 4, vertical section of ovary; 5, apex of style and its branches:—*all more or less enlarged.*

M. S. del., J. N. Fitch lith.

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Tab. 7149.

RHODODENDRON Boothii.

Native of the Bhotan Himalaya.

Nat. Ord. Ericaceæ.—Tribe Rhodoreæ.

Genus Rhododendron, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. ii. p. 599.)

Rhododendron (Eurhododendron) *Boothii*; frutex debilis, ramulis hirsutis demum glabratis, foliis ovato- v. oblongo-lanceolatis acuminatis basi rotundatis v. cuneatis supra laxe ferrugineo-hirsutis demum glabris, subtus minutissime lepidotis, corymbis densifloris, pedicellis brevibus hirsutulis, sepalis amplis late ovatis apice rotundatis, corolla campanulata flava 5-loba lobis rotundatis, staminibus 10, filamentis superne pilosis, antheris magnis fusco-aurantiacis, ovario lepidoto 5-loculari, stylo valido decurvo, stigmate incrassato truncato, capsula oblonga rugosa furfuracea, seminibus linearibus compressis utrinque caudatis, testa firma.

R. Boothii, *Nuttall in Hook. Kew Journ. Bot.* vol. v. (1853), p. 356. *Lem. Illust. Hortic.* 1858, t. 174. *Clarke in Fl. Brit. Ind.* vol. iii. p. 470.

Rhododendron Boothii is one of twenty-two species of the genus found in Bhotan by Mr. Booth, and described in Hooker's "Journal of Botany" for the year 1853, by the late Thos. Nuttall (a very eminent American botanist, who resided much in England). Mr. Booth was a nephew of Mr. Nuttall, and was sent by his uncle to collect chiefly seeds of Himalayan Rhododendron, shortly after the influx of Sikkim species had demonstrated the extraordinary richness of the Eastern Himalaya in that genus. Of those twenty-two species about a dozen were new, and of these again eight, including the present, have been figured in this work: namely, *R. Keysii*, t. 4875; *R. Hookeri*, t. 4269; *R. calophyllum*, t. 5002; *R. Windsori*, t. 5008; *R. Shepherdii*, t. 5125; *R. Kendrickii*, t. 5128; *R. Nuttallii*, t. 5146. The nearest ally of *R. Boothii* is *R. ciliatum*, t. 4778, from which it differs in its much larger size and dense heads of yellow flowers. It was found at an elevation of five thousand feet, epiphytic on oaks, and is described as a straggling shrub five to six feet high.

The specimen here figured was taken from a plant in the magnificent collection of Indian Rhododendrons formed by the late Mr. Mangles, of Valewood, Haslemere, which flowered in a greenhouse in April of the present year.

Judging by the results of botanical explorations lately made in Western China, it would appear that all previous estimates of the number of species of this magnificent genus of plants, are far below the mark, and that the

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discoveries made in the Eastern Himalaya are only harbingers of what are to be expected from the vast mountain regions still further to the east. It is interesting to trace the development of the genus across the old world; and it may be thus sumarized. In Europe three occur in the extreme west, *lapponicum* in Norway, *ponticum* in South Spain, and *ferrugineum* in the Pyrenees, the latter occurs in the Alps of middle Europe, with *hirsutum*, but does not extend into Asia, where *ponticum* reappears in Asia Minor, Syria, and in the Southern Caucasus, with *flavum* and *caucasicum*. The latter country (the Caucasus) is the Eastern limit of these three. Excluding the few high northern Asiatic species, none are found east of the Caucasus till entering the Affghan region, to which *affyhanicum* and *Collettianum* are confined. On reaching the Himalayan region the development of the genus advances with rapid strides. Four species are found in the Western Himalaya, between Kashmir and Nepal, *arboreum*, *campanulatum*, *barbatum*, and *anthopogon*, all of which advance to Sikkim, where twenty-nine have been collected. East of this province again, Bhotan has only twenty-five, seventeen of which are Sikkim species; but considering how imperfectly that great and lofty province has been explored (its Alpine regions not at all), it may safely be assumed that this number does not include half of what it contains. Proceeding eastwards little is known of the vegetation till China is entered, and as Mr. Hemsley informs me that between sixty and seventy species have been collected in its barely entered western mountains, by Père David, Dr. Henry, and others, it may be regarded as probable that the celestial empire contains more species of this genus than all the world besides. Eastward of China there is a rapid decrease, to fourteen in Japan, two or three in Western N. America, and about six in Eastern, including *R. lapponicum*, with which this summary began. From the Himalaya a stream from the genus flows south along the Malayan Peninsula to the Malay Islands, New Guinea, and S. Australia. Most of its members belong to a section with thin valve capsules and long-tailed seeds, and of these one alone is Himalayan, the *R. vaccinioides*, of Sikkim.—*J. D. H.*

Fig. 1, Portion of undersurface of leaf of the natural size, showing the minute scales; 2, stamen; 3, ovary; and 4, transverse section of do.:—*all enlarged.*

Tab. 7150.

ARISÆMA FIMBRIATUM.

Native of the Malay Islands.

Nat. Ord. Aroideæ.—Tribe Arineæ.

Genus Arisæma, *Mart.*; (*Benth. et Hook. f. Gen. Pl.* vol. iii. p. 965.)

Arisæma *fimbriatum*; foliis solitariis trisectis, foliolis late ovatis caudato-acuminatis, lateralibus obliquis, nervis supra profunde impressis arcuatis, petiolo lævi, pedunculo elongato, spathæ tubo elongato cylindraceo, lamina rubro-brunnea albo-lineata ovato-lanceolata erecta apice incurvo subcaudato-acuminato, spadice monoica tenuissima appendice longe exserto floribus neutris capillaribus crinito pendulo, inflorescentia tubo spathæ inclusa, feminea basilari floribus sterilibus interpositis nullis, masc, antheræ 3–4 stipitem coronantes, fæm. ovarium sessile globosum in stylum brevem attenuatum, stigmate capitato.

A. fimbriatum, *Masters in Gard. Chron.* 1884, vol. ii. p. 680 and 689, fig. 119; *Regel Gartenfl.* 1886, p. 357, fig. 40.

Arisæma fimbriatum was first described by Dr. Masters, and well figured, in the *Gardener's Chronicle*, from a plant which flowered in Mr. Bull's nursery (received from Messrs. Sander, of St. Alban), in 1885, and was supposed to have come from the Philippine Islands. As, however, specimens of the very same plant are preserved in the Kew Herbarium, which were sent by Mr. Curtis from Langkawi, an island off the west coast of the Malayan Peninsula, north of Penang, it may be reasonably concluded that the Philippine habitat wants confirmation. The nearest published ally of *A. fimbriatum* is *A. album*, N.E. Br. (Journ. Linn. Soc. Bot. xviii., p. 247), of the Khasia Hills, which has a much smaller and white spathe, and longer petiolules to the leaflets. This last presents the remarkable anomaly of having the male flowers sometimes at the bottom of the spadix, with the females above them, and at others the males and females are intermixed. As with *A. fimbriatum* the long exserted pendulous appendage of the spadix is crinite with filiform neuter flowers. A very similar plant to *album*, but with a green spathe, is in the Kew Herbarium, from the west coast of Siam, found on a mountain called Khao Loi Dao, at an elevation of seven

thousand feet, by the late Mr. Murton, formerly Superintendent of the Singapore Botanical Gardens.

These three species form a subdivision of Schott's section *Trisecta* of *Arsiæma*, distinguished by the filiform neuter organs that clothe the slender appendage, a character that occurs in no other species of this very large genus, except the Sumatran *A. ornatum* Miquel (Ann. Mus. Bot. Lugd.-Bat. vol. iii. p. 79, t. 3) which belongs to the section with pedatisect leaves.

A. fimbriatum has been cultivated at Kew since 1887, and flowers annually about midsummer; the specimen figured was sent by Messrs. Veitch.

Descr. *Leaf* solitary (and peduncle), clothed at the base with linear-oblong membranous sheaths, trisect; leaflets five to seven inches long, very shortly petiolulate, broadly ovate, caudate-acuminate, bright green above with very many and deeply sunk nerves, very pale beneath; petiole six to ten inches long, streaked with pale red. *Peduncle* as long as the petiole, and of the same colour. Spathe ten inches long; tube two and a half inches long, about two-thirds of an inch diameter; cylindric, closely striped with dark brown and white; lamina ovate lanceolate, erect with a decurved caudate-acuminate tip, purple-brown streaked with white. *Spadix* very slender, its decurved filiform appendix longer than the spathe, the exserted portion red-brown, and clothed with filiform neuter organs nearly an inch long, included portion with scattered green neuter organs a quarter of an inch long. *Male* flowers of scattered anthers clustered in threes and fours on the top of a stout stipes. *Female* flowers subglobose one-celled crowded ovaries at the very base of the spadix.—*J. D. H.*

Figs. 1 and 2, stamens :—*enlarged.*

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Tab. 7151.

SCAPHOSEPALUM PULVINARE.

Native of New Grenada.

Nat. Ord. Orchideæ.—Subtribe Pleurothalleæ.

Genus Scaphosepalum, *Pfitzer in Engl. & Prantl. Natürliche Pflanzenform.* **vol. i. p. 139.**

Scaphosepalum *pulvinare;* foliis elliptico- v. ovato-lanceolato acuto longe valide petiolato, pedunculo elato valido creberrime verrucoso, vaginis brevibus dissitis, racemo valde elongato stricto laxifloro, floribus subdistichis, ovario una cum pedicello sigmoideo bracteis vaginantibus oblique truncatis acutis longiore, sepalo dorsali ovato-lanceolato, lateralibus lanceolatis connatis marginibus erosulis in caudam subulatam teretiusculam rugulosam productis, disco callo magno oblongo elongato crasso carnoso medio sulcato instructo, petalis columnæ æquilongis cultriformibus, labello ligulato recurvo undulato, bipandurato marginibus serrulatis, disco medium versus callis 2 serrulatis instructo.

S. pulvinare, *Rolfe in Journ. Bot.* xxviii. (1890) 137.

Masdevallia pulvinaris, *Reichb. f. in Gard. Chron.* 1880, i. 200.

The genus *Scaphosepalum* consists of a small group of Orchids, the species of which have been referred, some to *Masdevallia*, some to *Pleurothallis*, and some to both, but which present characters in common foreign to these genera, and they further agree in habit *inter se*. The founder of the genus, Professor Pfitzer, of Heidelberg (author of the "Morphologische Studien, ueber die Orchideen blüthe" and "Natürlichen Anorndnung der Orchideen"), established it upon *Masderallia ochthodes*, Reichb. f., & *M.* (alias *Pleurothallis*), *verrucosa*, Reichb. f.; and it has been adopted by Mr. Rolfe in a very good article published in the journal of Botany cited above. In this article Mr. Rolfe includes under *Scaphosepalum* seven other plants hitherto for the most part referred to *Masdevallia*, amongst which is the *M. gibberosa*, Reichb. f., figured at t. 6990 of this magazine; including the subject of the present plate, and *S. antenniferum*, Rolfe, a species recently described in the "Gardener's Chronicle"), *Scaphosepalum* contains ten published species, together with one or more hitherto undescribed. Considering how

rapidly the knowledge of Pleurothalloid Orchids is being augumented by discoveries in New Grenada and the neighbouring States of America (Costa Rica and British Guiana), there is every reason to suppose that this new genus will prove to be a very considerable one. Its distinctive characters are the superior lip, the free or all but free dorsal sepal, the lateral sepals connate in a boat-shaped form under the lip, and the strongly recurved crumpled lip.

Mr. Watson informs me that *S. pulvinare* was received at the Royal Gardens from Mr. Veitch in 1888, and that in January last it formed a raceme now (November) twenty-seven inches long, which has borne thirty-seven flowers, and is still flowering. He adds that this plant will probably flower continuously for two years!

Descr. *Stems* tufted. *Leaves* coriaceous, four to six inches long, elliptic- or ovate-lanceolate, acute, bright green, seven to nine nerved, narrowed into a stout channelled petiole as long as the blade. *Peduncle* with the raceme one to two feet long, flowering continuously, very stout, closely warted, dark brown; sheathes half an inch long, tubular with truncate acute mouths; bracts like the sheaths; pedicel warted with the smooth ovary sigmoidly curved. *Flowers* sub-horizontal, an inch long, yellowish, closely mottled with dull red, coriaceous; dorsal sepal inferior, lanceolate; lateral connate into a broad boat-shaped limb with a terete grooved rough dagger-like point, margins erose; disk with a very large oblong longitudinally cleft callus. *Petals* very small, hatchet-shaped. *Lip* revolute, undulate, twice constricted on the serrulate margins, disk with two toothed linear calli about the middle. *Column* incurved at the top, and there somewhat crested at the back.—*J. D. H.*

Fig. 1, Connate lateral sepals; 2, apical portion of one lateral sepal; 3, petals, column, and lip; 4, column and lip; 5, column; 6, anther; 7, pollinia:—*all enlarged.*

M. S. del, J. N. Fitch lith.

Vincent Brooks, Day & Son Imp

Tab. 7152.

THALICTRUM Delavayi.

Native of Yunan.

Nat. Ord. Ranunculaceæ.—Tribe Anemoneæ.

Genus Thalictrum, *Linn.*; (*Benth. et Hook. f. Gen. Pl.* vol. i. p. 4.)

Thalictrum (Physocarpum) *Delavayi*; gracillimum, ramosum, glaberrimum, foliis latis laxe ternatim decompositis, ramulis rigidis ultimis filiformibus 3–5-foliolatis, stipellis nullis, foliolis breviter petiolulatis suborbicularibus 3–4-crenatis-lobulatisve basi rotundatis v. subcordatis, panicula pauci-laxiflora, floribus magnis longe pedicellatis cernuis pallide purpureis, sepalis ellipticis obtusis, filamentis gracilibus glabris, acheniis basi angulatis sed vix stipitatis dimidiato-ovatis recurvis compressis membranaceis costatis glabris, costis parallelis non reticulatis, stigmate oblongo sessili, stylo nullo.

T. Delavayi, *Franchet in Bull. Soc. Bot. Fr.* vol. xxxiii. p. 367; *Plant. Delavay.* vol. i. p. 10, t. 2, 3.

No better example of representative species could be found than those of *Thalictrum Chelidonii* of the Himalaya and *T. Delavayi* of Eastern China. Franchet, the author of the last named, says of it, "Toutes les affinités de *T. Delavayi* sont avec le *T. Chelidonii*," and he proceeds to distinguish the former by its stipellate partial petioles and the parallel not anastomozing ribs of the fruit. Much more conspicuous characters are the slender stipes of the achene and the long slender style of *T. Chelidonii*, as compared with the narrowed base of the achene and sessile oblong stigma of *C. Delavayi*. Franchet describes three varieties of this plant: the first, which may be considered the normal, is α. *decorum*, that here figured; the second, β. *acuminatum*, is much stouter, with leaflets two-thirds to three-quarters of an inch broad, broader multifid persistent stipules, and long acuminate sepals. The third, γ. *parviflorum*, is that on which the species was founded (though not to be regarded as its typical form); it has a narrow many-flowered panicle, sepals only one-fourth to one-third of an inch long, and minute caducous stipella.

T. Delavayi is a native of the mountains of Yunan at elevations of four thousand to six thousand feet. The

specimen figured, which flowered in the Royal Gardens of Kew in June last, was received in August, 1889, from the Jardin des Plantes, Paris.

DESCR. A very slender herb, two to three feet high. *Radical leaves* long-petioled, ternately decompound, triangular in outline, ten to twelve inches broad; petiole, petiolules and their branches very slender, wiry, dark purple, quite smooth; stipules and stipellules small, green; leaflets three to five on the ultimate branches, distant, one-third of an inch broad, obtusely three- to five-lobulate, base cuneate rounded or cordate, pale beneath. *Flowers* pendulous, pale purple-blue, in very lax panicles, with linear bracts at the axils; pedicels long, slender, decurved. *Sepals* half an inch long, elliptic-ovate, obtuse, ribbed. *Stamens* very many, as long as the sepals; filaments filiform, glabrous. *Carpels* ten to twelve, subpuberulous, dimidiate-obovate, narrowed to the base and apex, with three parallel ribs; stigma linear-oblong, decurrent on the narrowed apex of the achene.—*J. D. H.*

Fig. 1, Stamen; 2, head of carpels; 3, single carpels:—*all enlarged.*

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